IMPROVING OUTCOMES FOR PATIENTS ADMITTED THROUGH THE EMERGENCY DEPARTMENT: IMPLEMENTATION OF A STANDARDIZED REPORT PROCESS

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ABSTRACT

Eric Wolak: Improving Outcomes for Patients Admitted Through the Emergency Department: Implementation of a Standardized Report Process
(Under the direction of Cheryl Jones)

Purpose: The purpose of this quality improvement (QI) project was to implement a standardized ED-to-inpatient RN handoff process that improved handoff and process flow, with a goal of decreasing Emergency Department length of stay for patients being admitted and admission wait time. **Summary of the Evidence:** The exchange of patient information is a necessary aspect of care across all healthcare settings. A critical component of this exchange is patient handoff. However, lack of standard work in the handoff process can lead to inefficient communication and delayed patient flow. Three themes emerged from a review of literature: 1) communication and its' complexity, 2) tools used to improve communication, and 3) the use of QI methodologies for improving the handoff process. **Description:** Lean A3 methodology was used to address improvement, resulting in four key tools that were implemented: 1) ED to Inpatient Handoff Guideline, 2) Situation, Background, Assessment, Recommendation (SBAR) Communication Tool, 3) ED Charge Nurse Shadowing Guideline, and 4) Inpatient Charge Nurse Shadowing Guideline. **Evaluation:** Outcomes were measured using Analysis of Variances (ANOVA) for Emergency Department length of stay (LOS) and admission wait time for the months one year prior to implementation, one month before implementation, and two months of implementation of tools. In addition, ANOVA was used to compare patient transfer time and length of time to give/receive report pre versus post implementation of tools. **Relevance:** The ED LOS and admission wait time ANOVAs were not statistical different among the compared

months ($p>0.05$). However, patient transfer time had a statistically decreased ($p<0.05$) time variables, going from 30.5 minutes (SD=18.2) pre-implementation to 24.2 (SD=8.8) and 21.7 minutes (SD=7.4) post-implementation. In addition, the length of time to give/receive report for ED admissions also had a statistically decreased ($p<0.05$) time variables, going from 3.8 (SD=1.6) minutes pre-implementation to 2.8 (SD=1.2) and 3.1 minutes (SD=1.3) post-implementation. **Implications:** The results of this project highlight how implementation of standard work can improve ED to inpatient flow. Although LOS and admission wait times were not statistically decreased, implementation of tools and standard work can potentially improve patient flow and communication efficiency between departments with different care priorities.

To my amazing wife, Erica, whose love, support, and encouragement were instrumental to the completion of my DNP.

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LIST OF ABBREVIATIONS

ANOVA	Analysis of Variances
CN	Charge Nurse
DNP	Doctorate of Nursing Practice
DPT	Dyadic Power Theory
ED	Emergency Department
EHR	Electronic Health Record
IRB	Institutional Review Board
LOS	Length of Stay
NA	Nursing Assistant
PL	Project Lead
PRISMA	Preferred Reporting Items for Systematic Reviews for Meta-Analysis
RN	Registered Nurse
SBAR	Situation, Background, Assessment, Recommendations
SD	Standard Deviation
QI	Quality Improvement
UNCMC	University of North Carolina Medical Center

CHAPTER 1: INTRODUCTION

The Emergency Department (ED) is often the first point of healthcare contact for many patients before they are admitted to the hospital. Consequently, the problems for which patients are treated in EDs range from very minor, with no admission required, to very serious, with lifesaving measures being required. Because Emergency Departments are required to treat all patients who seek treatment and the severity of their illnesses can vary widely, the milieu in the ED can be fast paced and, at times, chaotic. This environment creates a situation where patient information is shared during the handoff process among care providers, including Registered Nurses (RN), very quickly, and in an abbreviated format or communication style. Patient handoff is defined as the sharing of patient information from one clinician to another, either during shift change or in transitioning the patient from one area of care to another (Sorrentino, 2015).

When patients are admitted from the ED to inpatient areas, the content and specifics of patient information reported can vary from one nurse to another, and often consists of a brief summary of the patient's status and history. This report is often much less detailed than the type of report inpatient nurses provide to one another when patient care is passed from nurse-to-nurse at the end of shift or at transfer to another inpatient unit. Because of the variability in care goals and workflow, ED-to-inpatient nurse report is commonly an opportunity for improvement (Sorrentino, 2015). There are several problems that have been linked to ED-to-inpatient handoffs. Gopwani, Brown, Quinn, Dorosz, and Chamberlain (2015) noted that the ED-to-inpatient handoff process is often disrupted, resulting in a protracted ED length of stay (LOS).

Others (Apker, Mallak, & Gibson, 2007) point to the potential patient care quality and safety concerns that arise from incomplete or misunderstood patient information.

Problem Statement

Patient handoffs represent a critical time and event. Handoffs in health care organizations occur when patient information is shared between health care professionals -- at change of shift, when patients move from one department to another, or anytime responsibility for a patient's care is passed from one professional to another. Although a normal part of patient care delivery, patient handoff creates an opportunity for inaccurate information to be transferred, a misunderstanding of information transferred, and/or a lack of information to be shared (Hilligoss, Mansfield, Patterson, & Moffatt-Bruce, 2015).

Handoffs from the ED-to-inpatient units offer another unique set of challenges, primarily because the differing priorities of ED and inpatient care. For example, ED care typically focuses on triage, meeting immediate patient care needs, and then expeditious patient transition -- to home, an inpatient unit, or another facility -- to ensure ED access to the community at large (Lee et al., 2017). Patients remain in the ED for only minutes to multiple hours until they are stabilized and can undergo a transition in care. In contrast, the priorities of inpatient care units is focused on treatment, cure and discharge – to home, another facility, or a peaceful death. These priorities mean that inpatient care is typically spread over a longer period of time – days or weeks – to allow for care to occur.

Such dramatic differences in perspectives of care between ED and inpatient staff can create friction during the patient care handoff process and delay transfer (Hilligoss, 2014). The result of these differences is often a lack a consistent process, further resulting in delayed transfer time (Gopwani et al., 2015). A consistent process for ED-to-inpatient care transition could therefore improve process flow and potentially decrease length of ED stay (Sorrentino, 2016).

The University of North Carolina Medical Center (UNCMC), the facility where this project will be conducted, has a current average ED LOS for patients being admitted to an inpatient bed of approximately 500 minutes (E. Lawson, personal communication, April 9th, 2018; Medicare.gov, n.d.). This compares with the national average of 336 minutes (E. Lawson, personal communication, April 9th, 2018; Medicare.gov, n.d.). Furthermore, the average time from a decision to admit to the patient leaving the ED (wait time) for an inpatient area is approximately 150 minutes, compared to the national average of 137 minutes (Medicare.gov, n.d.). A potential reason identified by key UNCMC leaders for this delay is the lack of an established and consistent process for how patient transition and reporting is made between ED and inpatient nurses, and how the patient is ultimately transferred between these care areas. For example, there is no established process for how an ED RN calls report to an inpatient unit, or the structure and content of the handoff, or the tools that should be used for reporting critical patient information, or an acceptable process for the transfer, including the time of transfer or the resources needed during transfer (E. Lawson, personal communication, September 13th, 2017). This lack of a standard process not only contributes to increased opportunities for errors, but also introduces delays in care and inefficient use of ED and inpatient beds.

Evidence on handoffs between the ED and inpatient care units suggests that ED-to-inpatient handoffs are a common area for improvement in many healthcare organizations. A review of the literature further demonstrates that by creating a standardized process that uses agreed-upon tools to foster communication, handoffs can be improved to span a shorter duration, more efficiently transfer information, and more effectively improve the quality of information transferred. Further, evidence in the literature supports the use of Lean methodologies to assist in improving this process.

Purpose

The purpose of this Doctorate of Nursing Practice (DNP) quality improvement (QI) project was to implement a standardized, evidence-based ED-to-inpatient RN handoff process that improves process flow and decreases patient ED lengths of stay and wait time for admission. For the purposes of this project, the patient population of focus was ED patients being admitted to all inpatient and observation nursing units at UNCMC.

Significance to Nursing and Health Care

Approximately half of all non-obstetric hospital admissions in the United States enter the hospital through the ED (Hilligoss et al., 2015). This figure represents hundreds of thousands of patients annually who are admitted to hospitals through this path. Each of these admitted patients will have a transition point when they leave the ED and are admitted to an inpatient patient care unit. It is imperative that this transition point be efficient for a variety of key reasons. Not only is the transfer of information imperative for seamless care, but an efficient transition allows for less time in the ED, resulting in increased ED access for the community, and a more timely arrival to inpatient care. The proposed project provides an opportunity to improve patient care as they move through the system from the ED to inpatient units and, if successful, may provide a roadmap for other healthcare systems to improve and streamline their handoff and transfer process.

Chapter Summary

This chapter highlighted the downstream effect nursing communication between inpatient and Emergency Department settings have on overall ED length of stay. The clinical goals of immediate care provided in the ED are often incongruent with the long-term care goals of the inpatient area. In addition, a lack of mutual understanding and expectations between these two clinical sites can create a communication gap, which may further lead to an unnecessary length

of stay. A multi-department quality improvement project that establishes expectations and communication tools may improve overall ED length of stay for admitted patients. The next chapter discusses the literature used to support this intervention.

CHAPTER 2: REVIEW OF THE LITERATURE

Chapter Introduction

This chapter reviews the current literature related to patient transition and handoff from one department to another, specifically from the ED to inpatient units. The following are included in this chapter: the search strategy, the results of the Preferred Reporting Items for Systematic Reviews for Meta-Analysis and the key themes that emerged from the review. The search strategy will be discussed first.

Search Strategy

In consultation with the health science librarian for the University of North Carolina at Chapel Hill, a search was performed via PubMed and CINAHL to evaluate current literature on patient transitions and handoffs, with a focus on the ED. Inclusion criteria were applied to focus on literature in the topic area, including clinical studies, comparative studies, multicenter studies, observational studies and/or theoretical articles. Search terms included:

(“emergency department” OR “emergency room”) OR ED OR ER

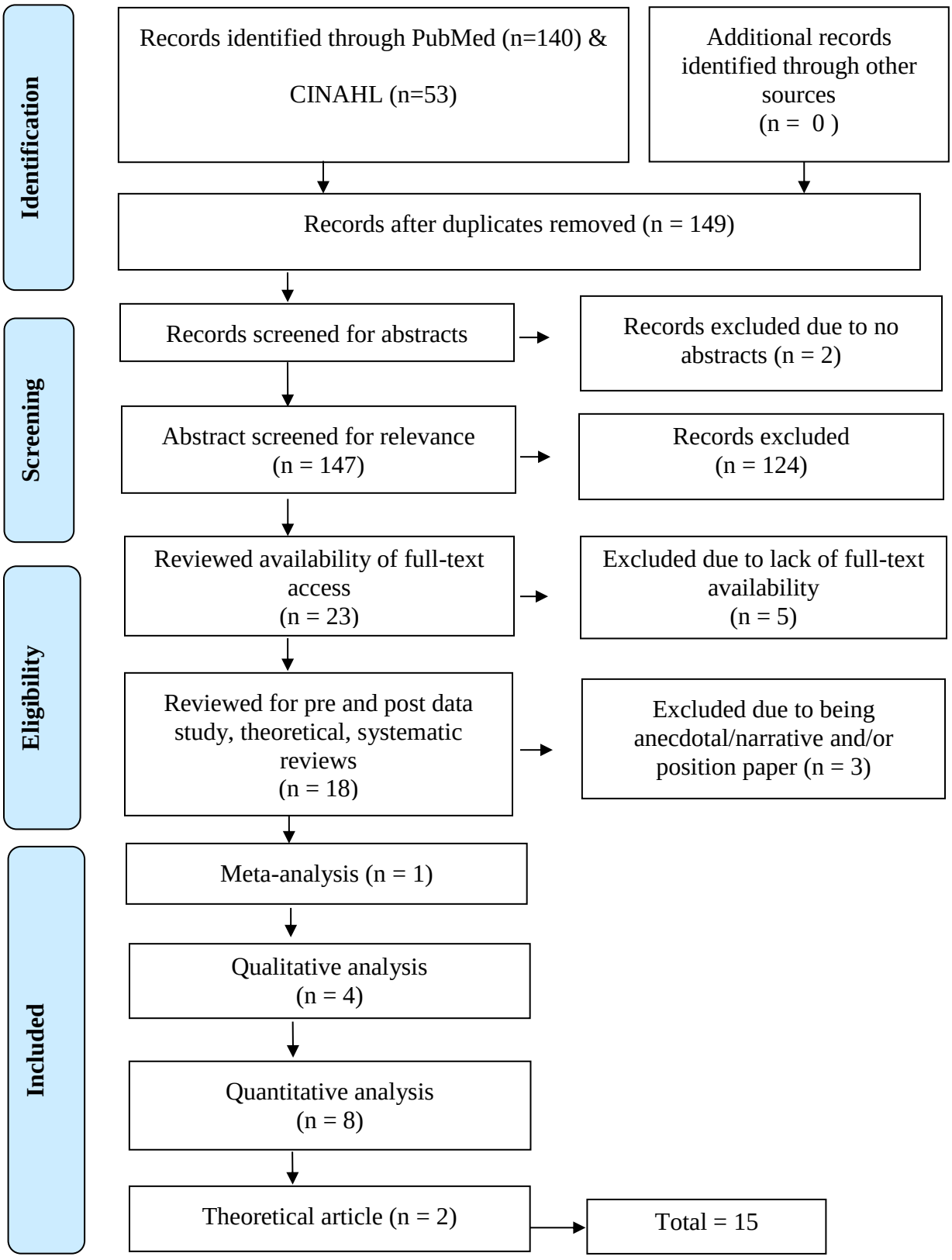
AND ((handoff* OR "hand-off" OR report* OR transition*

AND (admission OR admit*)) AND inpatient

AND ("length of stay" OR LOS OR “time factors”)

In addition, only articles published in English were searched. Refer to the Preferred Reporting Items for Systematic Review and Meta-Analysis (PRISMA) in Figure 1 for details.

Figure 1. PRISMA Diagram



After the elimination of duplicate articles found in both PubMed and CINAHL, a total of 149 articles were identified to be reviewed for relevance. After reviewing these article's titles and abstracts, and focusing on articles with an emphasis on handoff theory, qualitative analysis and quantitative studies, a net total of 15 articles were considered significant to the problem and project proposal (see Appendix A).

Themes

These 15 articles were reviewed, critiqued and assessed for themes, commonalities in content, and conclusions. Three primary themes were identified. The first was the general complexity of communication. This complexity is further framed under the contexts of relaying patient acuity, relationships among parties, power distribution between parties, and disciplinary perspectives conveyed during communication (Hilligoss et al., 2015). The second theme identified was the use of tools to standardize and facilitate handoffs. The third theme identified was a focus on quality improvement process, such as Lean, as a methodological approach to improve the ED-to-inpatient transition. Each of these three areas will be discussed in the following sections.

Communication complexity

It is estimated that approximately 80% of serious medical errors in the United States are a direct result of miscommunications between caregivers during patient handoff (The Joint Commission, 2018). Articles retrieved in this review of literature emphasized the complexity and ambiguity of communication in healthcare settings.

A qualitative study (Apker et al., 2007) examined physician perceptions of ED-to-inpatient handoff and transitions of care during communication. Twelve physicians (six ED physicians and six hospitalists) at a Midwestern hospital were interviewed using a semi-structured interview guide to gather their perceptions of ED-to-inpatient handoffs. They

described communications between ED to inpatient as a “gray zone”, and identified three key study findings: 1) communication barriers; 2) conflicting expectations of ED physicians and hospitalists about important patient information to communicate; and 3) safety concerns related to handoffs, specifically unclear admission guidelines, the high potential for missed information, and a misunderstanding of clinical presentation. These researchers noted that inconsistencies in how two individuals interpret patient information, differences in perceived priorities, and a lack of agreed-upon handoff expectations created ambiguity when information was exchanged. They also noted that the details conveyed during handoff lacked substantive patient information.

Education about communication techniques among and across disciplines is a tacit skill that is assumed to occur during the natural course of training and education, and, in turn, eliminate the “gray zones”. However, a 2017 study by Lee et al. questioned this assumption. This cross-sectional study surveyed leaders in all physician resident programs across the nation on how they educated and evaluated resident handoffs. While 74% of program respondents indicated that they provided handoff instructions in some way, shape or form, only 37% had a structured handoff orientation process. Further, approximately 49% of educators/leaders in responding programs indicated that they do not formally evaluate resident handoffs (Lee et al., 2017). This study underscores the concern that although communication is a cornerstone of healthcare professionals, there is a lack of attention to its importance in educational programs.

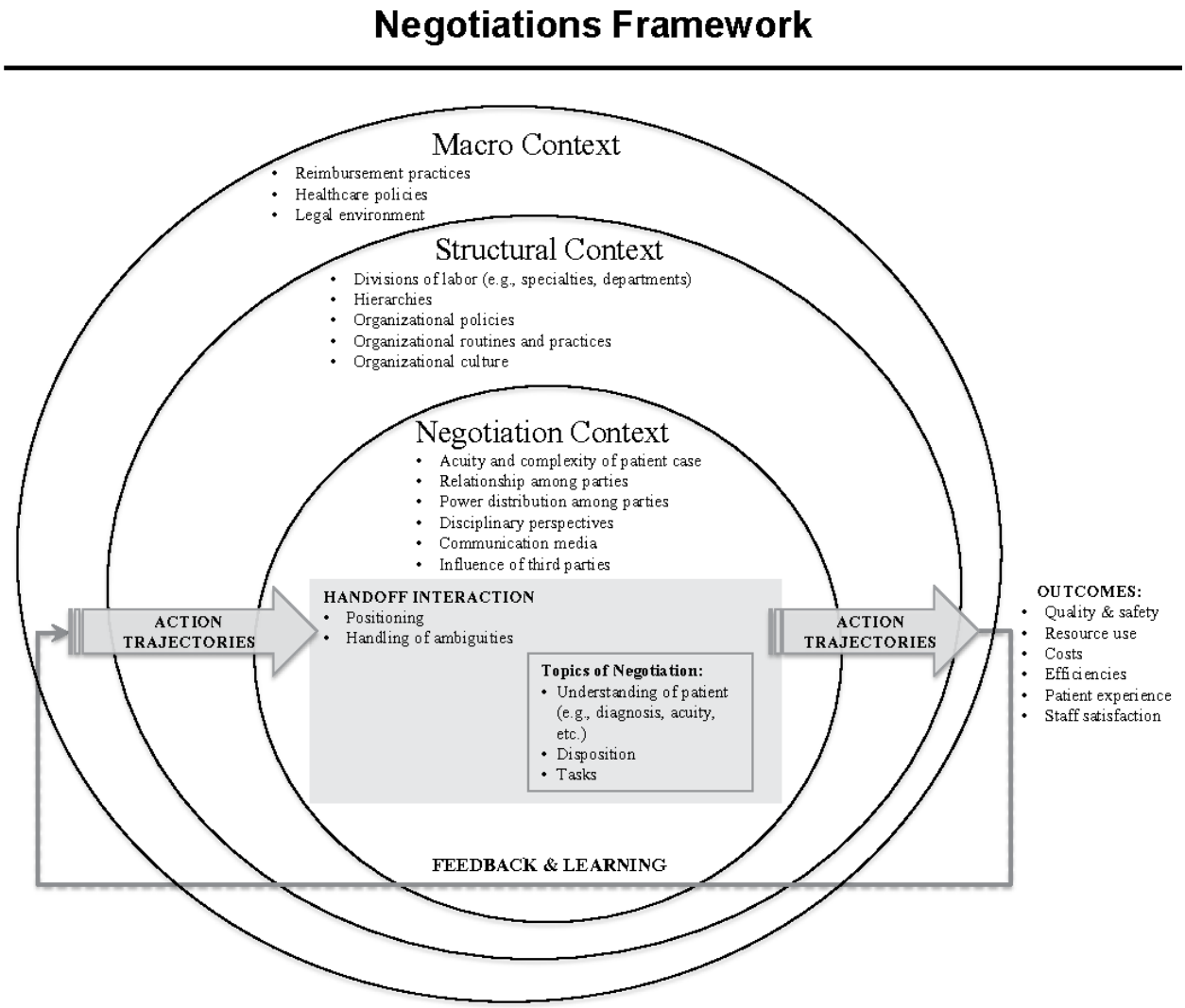
The complexity and ambiguity of communications and the themes identified in Apker et al. (2017) were reinforced by Hilligoss and Cohen (2013). This theoretical article addressed between-service handoff reports by physicians and highlighted these reports as being challenged by intra-professional differences, distribution of power differences, and a lack of established relationships. Subsequently, the communication dynamic becomes more of a negotiation rather

than an exchange of key information. One reason that negotiation becomes more prominent during ED-to-inpatient handoffs is because such a transition requires agreement by both the ED physician and inpatient physician that a patient needs to be admitted; that decision may, at times, conflict (Hilligoss & Cohen, 2013).

Hilligoss (2014) further examined the idea of negotiation during communications in an ethnographic study of ED and inpatient physicians. A total of 48 semi-structured interviews were conducted by both ED physicians and hospitalists, 349 hours of physician handoff observations were examined, and 48 telephone handoff conversations were recorded and analyzed. Results of this study demonstrate the use of four key communication styles or themes related to ED-to-inpatient MD handoffs: 1) persuasion, 2) competition, 3) packaging, and 4) collaboration. The theme of persuasion represents the idea that handoffs are a zero-sum game, with one stakeholder giving patient information to a receiving stakeholder, who must agree to receive the transaction. The theme of competition reflects a winner/loser mentality communicated during handoffs. Comments made during the interviews used sports analogies to describe the handoff process. For example, words such as "blocking" and "punting" admissions were often used. This suggests that the act of handing off care is viewed as a zero-sum game with a winner and a loser. Packaging relates to inpatient providers' expectations about what information should be performed and/or completed in the ED, contrasted with what the ED providers felt should be completed. Finally, collaboration highlights how, at the end of the day, the ED and inpatient units are all on the same team, with a common goal of caring for patients. This study reveals the complex and interactive nature of patient handoffs and illustrates how miscommunications and errors at handoff may not be because of distractions in the environment and/or imperfect memory, but rather because they are a dynamic process that occurs between two or more individuals with different expectations.

In 2015, Hilligoss et al. published a mental model for handoff negotiations (see Figure 2).

Figure 2. Negotiation Framework (Hilligoss et al., 2015)



This framework is modeled after the Dyadic Power Theory (DPT) first described in 1976 by Rollins and Bahr and expanded in 2004 by Dunbar. Hilligoss et al. (2015) creates a visualization of how handoffs are negotiated under the context of patient acuity, peer to peer relationships, peer to peer power distribution, disciplinary perspectives, communication media and any third-party influences. Handoffs are either successes or failures depending upon how patient information is shared, how the relationship among parties is managed, how disciplinary

perspectives are standardized, and if tools are used to standardize the exchange of information. Specific to ED-to-inpatient handoffs, if the contexts of negotiation are addressed, then handoffs could be expected to improve quality/safety, reduce resource utilization, decrease costs, improve efficiencies, improve patient experience and increase staff satisfaction. However, if they are not addressed, the opposite of these outcomes are at a higher risk of occurring (Hilligoss et al., 2015).

A systematic review by Walker et al. (2016) evaluated 14 articles specific to patient handoff to uncover safety issues and errors. These errors were primarily due to distractions, data omissions, poor construction of messages, failure to take note of important information or misinterpret of data provided. The exchange of information can thus contribute to patient care problems, as well as inefficient handoff reports (Brannen, Cameron, Adler, Goodman, & Holl, 2009). While this study highlighted the lack of information exchange that can often occur in patient handoff, it provided another important point: By creating a process where information on patient safety and acuity is exchanged in a consistent way, ED-to-inpatient unit handoffs could be more comprehensive.

Health care professionals may not realize that inaccurate or inconsistent information may be exchanged during handoff. A 2009 quantitative study by Brannen et al. critiqued 36 recorded handoff communications between ED and inpatient residents to determine how effective physician handoffs were in relaying patients' severity of illness and active problems. Each resident rated the severity of individual patient illness and created a problem list. Three months later, the attending physician listened to the recorded calls, rated the patient's severity of illness, and created a problem list of their own. Analysis of these data demonstrated that only 64% of handoff pairs achieved agreement on patients' severity of illness, and there was inconsistency in

achieving a shared understanding of illness and problems for the most critical patients. These findings suggest that often clinically significant information is not consistently relayed when report is given in an unstructured way, which can cause the receiving physician to infer assumptions.

A 2017, a nursing study evaluated the quality of nursing handoffs in an Italian teaching hospital (Ferrara, Terzoni, Davi, Bisesti, & Destrebecq, 2017). This study used the Handoff Clinical Evaluation Exercise (CEX) scale to assess 48 shift changes and 192 handoff reports by medical-surgical nurses. Nurses were asked to assess handoffs by completing the Handoff CEX scale, composed of six domains: 1) setting, 2) efficiency, 3) content, 4) communication skills, 5) clinical judgment, and 6) professionalism. These areas were scored on a scale of 0 (not relevant) to 10 (very significant). Results indicated the highest agreements were in the areas of content, communication, and efficiency, but only moderately so. The other three domains scored lower than average on agreement about handoff. Of note, this was the only nursing-specific study identified under the theme of communication complexity, which underscores the lacking literature on RN to RN handoff communication.

Tools

Standardizing the handoff process is one way to facilitate a shared understanding of information being communicated (Brannen et al., 2009). However, standardization often requires the use of tools to ensure the process is done the same way regardless of the type of patient, clinician, or unit (Gopwani et al., 2015). In a 2015 prospective, observational study, the SOUND (Sound, Objective data, Upcoming tasks, Nursing input and Double check) tool was developed and implemented by ED clinicians (physicians, nurse practitioners, physician assistants and nurses) to facilitate the admission of patients to inpatient units. Baseline data included 286 admission handoffs that were critiqued on the five SOUND components. At baseline, all

clinicians spent an average of 52.9 seconds discussing each patient with the accepting inpatient physician and addressed a minimum of four of the five SOUND components only 26% of the time. After implementation of the SOUND standardized approach, 352 patient admission handoffs were observed. Compliance on at least four of the five components increased to 63.6% ($p<0.01$) and time spent discussing each patient rose to 73.0 seconds ($p<0.01$) (Gopwani et al., 2015). Although more time was spent on reporting, this study demonstrated that a standardized tool could help ensure that specific information is discussed for each patient to foster communication among different types of clinicians.

A prospective interventional study conducted on a medical unit at a general hospital in China implemented a standardized nursing verbal handoff form. This form, or tool, included patient demographics, information on falls risk, oxygen therapy, electrocardiogram monitoring, intravenous catheters or lines, naso- or gastro-intestinal decompression, indwelling catheter and pressure injury risk (Zou & Zhang, 2016). Implementation of this tool correlated with a decrease in nursing error rates from 9.2 to 5.7 per 100 admissions ($p<0.001$). Additionally, handoff-related error rates decreased from 2.7 to 0.3 per 100 admissions ($p<0.001$). Other quality metrics, including pressure injury rates, inappropriate care of lines rates and falls rates, were significantly decreased (Zou & Zhang, 2016). As with Gopwani et al. (2015), this study suggested that a report tool may help standardize handoff reporting to facilitate the consistent exchange of information, and also that such information improves patient care and quality outcomes.

It should be noted, however, that a shared understanding of a patient's clinical care needs does not need to occur via verbal handoff. In the fast-paced world of healthcare, the challenge of finding a concurrent time for an inpatient and outpatient clinician to exchange patient information and discuss a patient transition can cause unnecessary transfer delays (Sanchez et al.,

2017). This problem was the focus of a 2017 study, which used a handoff report tool integrated in the electronic health record (EHR) to evaluate a model for electronic handoffs between the ED and inpatient units. This study addressed compliance of asynchronous report via EHR, as well as time from admission order placement in the ED to patient admission on the inpatient unit. Results of this study demonstrated consistent compliance with electronic handoff each year, increasing from 77.5% to 87.3%. Time to admission also had a significant decrease each year, resulting in a time-savings of 9 min in 2011, and 18 min in 2013 and 2014, with a p-value of <0.001 (Sanchez et al, 2017). This study supports the use of standardized tools to facilitate patient transition from ED-to-inpatient care, decreases ED LOS, and suggested that such transfer of information does not require verbal exchange/communication.

Relaying consistent information between clinicians is key in mitigating errors. A 2013 prospective study assessed rates of medical errors and preventable adverse events with pediatric patients after implementing an ED resident handoff bundle (Starmer et al., 2013). This study compared medical errors and preventable harm before and after implementation. The bundle implemented was the SIGNOUT? mnemonic (Sick or DNR, Identifying data [age, gender, and diagnosis], General hospital course [brief overview of events in hospital], New events of the day, Overall health status, Upcoming possibilities with plan, and Tasks to complete). Results demonstrated a significant reduction in preventable medical errors, such as incorrect medications ordered and/or dosage, decreasing from 33.8 per 100 admissions to 18.3 per 100 admission ($p<0.001$). In addition, preventable adverse events decreased from 3.3 per 100 admissions to 1.5 per 100 admissions ($p<0.05$) (Starmer et al., 2013). A secondary metric of time spent by providers at the patient bedside also statistically increased by 2% ($p<0.05$), a concept supported by (Gopwani et al., 2015).

A recurring feature of these studies is the use of standardized tools to facilitate communications, which is consistent with the negotiation conceptual model presented by Hilligoss et al. (2015) (see Figure 2). Use of a standardized report tool was reported to help address patient acuity/complexity, facilitate relationships, and reduce any potential power distribution. By creating and consistently using an agreed-upon tool, each discipline/unit is asked to provide input into what is important to them to provide optimal patient care. This process allows for all components of patient acuity to be addressed as perceived by both the ED and inpatient arenas. It also helps establish agreed-upon expectations by both parties. Finally, by having these expectations, any form of power inequity between inpatient/outpatient or between nurse to nurse or provider to provider is reduced and/or eliminated. Once expectations are set and there is a checklist of what needs to be discussed, there is less of a "gray zone" that one must navigate (Apker, 2007). Again, it is striking that only one article in the theme of "tools" was specific to nurse-to-nurse handoff, highlighting the need for further evaluation and publication in this arena.

QI strategies and Lean methodology

A review of the literature demonstrated the complexity involved with patient handoff from one level of care to another. The literature also indicated that a standardized process can increase information sharing between and across disciplines and potentially decrease errors related to handoffs. However, another area revealed in the literature is the use of quality improvement (QI) strategies to standardize reporting, tools and transfer processes to ensure handoffs are performed the same way every time, regardless of location or stakeholders. Lean methodology is the approach mentioned most frequently that could provide more efficient and effective communications that improve ED-to-inpatient transition handoffs. This is especially important given that this DNP project focused on decreasing ED LOS for admitted patients and

admit wait time by improving the ED-to-inpatient handoff process. Framing solutions using approaches that bring focus to the quality outcomes of interest was therefore essential.

Lean principles emerged in the manufacturing industry in Japan shortly after WWII as a way of increasing efficiencies and managing costs. By the year 2000, Lean principles were commonplace in manufacturing industries such as Toyota and Boeing, but had not been a focus in health care. Soon thereafter, a handful of health care organizations began using Lean principles to improve outcomes and the financial bottom line. The core concepts of Lean include: 1) specification of value from the standpoint of the end customer; 2) identification of all steps in a process, eliminating any steps which do not add value; 3) ordering of the steps in tight sequence so the process flows smoothly; 4) customer-derived value from the subsequent upstream activity; and 5) constant continuation of the process for continued improvement (Kenney, 2011). Since 2000, the use of Lean principles in healthcare settings has increased, as reflected by the increasing number of publications on its effectiveness. Along with this emergence in the literature has come the clarification of tools and techniques that are used to implement Lean principles.

Within the context of ED-to-inpatient handoffs, failure mode effect analysis (FMEA), a common Lean methodology tool, has been used to map workflow and help analyze case deficits/failures. A 2015 article described the use of FMEA to evaluate ED-to-inpatient handoff communications and identify opportunities for improvement (Sorrentino, 2016). After a multidisciplinary team mapped out the flow of handoff reports, FMEA was used to identify waste in the process in real time. By using FMEA to critique workflow, the team determined that handoff report tools were not being used, and that handoff reports were not being communicated

in a consistent way. Once these gaps were identified, the team then worked with ED staff to streamline the process and ensure key components of the process were used (Sorrentino, 2016).

Although there is literature highlighting the value in using Lean methodologies to evaluate and improve processes within healthcare, very little has been published to evaluate staff perception of Lean. A 2012 quality improvement article assessed staff perception of Lean methodology specifically related to nursing shift handoff (Klee, Latta, Davis-Kirsch, & Pecchia, 2012). This project was a continuous multi-year quality improvement handoff initiative. Findings from this study on nurses' perceptions of the quality of shift handoff demonstrated a steady rise in satisfaction with the handoff process, reaching over 80% by study day 90 and remaining at approximately 85% satisfaction at six and 12 months.

In addition to being perceived as valuable by the care team, Lean methodology for quality improvement must also demonstrate sustainability. Klee et al. (2012) reported that using Lean principles to improve handoff demonstrated 100% compliance in safety check audits up to four years post-implementation. The time spent on handoff was also reduced 20% related to reporting, with 77% of staff completing handoff in less than 30-minutes by week 5 post-implementation. Although this article's focus was on inpatient handoffs and not ED-to-inpatient care transitions, it provides evidence that not only can Lean techniques make the handoff process more efficient, but also that staff perceive value in Lean principles, as well as the immediate and long-term impact on process changes.

However, such high marks from staff on the use of Lean principles to improve care are not consistently reported in the literature. A 2016 retrospective qualitative case study examining Lean project initiatives focused on ED LOS reported little agreement among staff on QI success when Lean principles were employed (Leggat, Gough, Bartram, Stanton, Bamber, Ballardie, &

Sohal, 2016). Although LOS outcomes of the QI project were successful, demonstrating that the number of patients leaving the ED in eight hours or less increased from 40% to 70%, a main theme identified in the interviews was that staff felt the focus of Lean projects was too much on LOS and moving patients through the system faster, rather than truly improving quality of care. The concern expressed by staff was that Lean projects tended to focus solely on time efficiency, rather than improved patient care (Leggat et al., 2016). This study addressed this concern by evaluating all QI projects related to LOS, not just patient handoffs.

Chapter Summary

The exchange of information is a necessary aspect of patient care delivery in and across all healthcare settings, and the critical component of this exchange is patient handoffs (Hilligoss & Cohen, 2013). However, a comprehensive exchange of information does not always occur. Of the fifteen articles, three key themes emerged: 1) communication and its' complexity, 2) the tools used to improve communications and handoffs, and 3) the use of QI methodologies for improving the handoff process. Although the literature reviewed and the themes that emerged provide evidence related to ED-to-inpatient handoff, the focus of studies and findings are inconsistent in the addressing the practice problem of interest. Some of the literature only examined shift to shift handoff, rather than ED-to-inpatient handoff (Farrara et al., 2017; Hilligoss et al., 2015; Starmer et al., 2013; Zou & Zhang, 2016). With the exception of five articles (Ferrara et al., 2017; Klee et al., 2015; Leggat et al., 2016; Sorrentino, 2016; Zou & Zhang, 2016), the majority of the literature focused solely on improving physician communication. This represents a gap in the literature on nurse-to-nurse handoffs from ED to inpatient care. In addition, of all the articles reviewed, only two reported data on ED LOS relative to ED-to-inpatient unit handoffs (Legatt et al., 2016; Sanchez et al., 2017) and none reported ED to admission wait time. As ED LOS and admission wait time are key outcome

metrics for this quality improvement project, this gap in the literature presented an opportunity to further examine this concept and provide data on improving ED-to-inpatient handoff and ED patient LOS.

Despite these shortcomings, what is evident in the literature is that ED-to-inpatient handoffs involve a complex process that can have a significant impact on quality of care. Using QI processes and Lean principles, in particular, to standardize communications could potentially reduce time spent communicating and improve the quality of patient care and LOS, while also providing more information about the effect of Lean principles on quality of care. There is a strong Lean culture at the project site, with most staff going through some form of Lean training and most QI projects using Lean methodology. Therefore, this literature review supports this DNP focused on improving the quality of ED-to-inpatient handoffs, standardizing nurse-to-nurse communications using tools to facilitate handoff processes, with the overall goals of decreasing ED length of stay and wait time for patient admissions at UNCMC.

CHAPTER 3: THEORETICAL FRAMEWORK

Chapter Introduction

This project was guided by Dyadic Power Theory (DPT), a communication theory that can be used to predict and help explain the behaviors of two individuals who are attempting to exchange information. The key principle behind DPT is communication behaviors that can either facilitate or hinder the sharing of ideas and decisions (Rollins and Bahr, 1976). For the purposes of this project, DPT was used to identify solutions to the problems with communication handoffs from the ED-to-inpatient nursing care.

Dyadic Power Theory

A key premise behind DPT is the assumption of power distribution and stereotypes (Rollins and Bahr, 1976), specifically between a husband and wife dyad. When goals are aligned, power becomes equalized between the dyads and communication tends to be supportive, allowing for a smooth exchange of ideas. However, when goals do not align, each individual attempts to gain power over the other, which is asserted through aggressive communication behaviors, resulting in misinformation or reduced information exchange.

Dunbar (2004) expanded DPT from the husband-wife communication deficits that arise from traditional power differentials, to include dyadic communication between individuals of different cultures and subcultures. In this updated interpretation, individuals of two different cultures or subcultures were postulated to create and perpetuate stereotypes based on how they communicate and the expectation one has toward the other.

Although DPT was not originally designed or discussed in the context of healthcare or patient handoffs, it lends itself well to understanding issues around communications that occur

between providers and hospital departments, and the problems that may arise during communications. Within the fifteen articles reviewed, Hilligoss et al. (2015) used the DPT to create a negotiation framework focusing on handoffs (see Figure 2). Dyadic Power Theory and this framework underscores the complexity of sharing information and can lay the groundwork for creating norms and expectations around what is communicated about patient needs, disciplinary perspectives, power distribution within and between clinicians, and relationships. Thus DPT provided a lens through which this project focused on improving communications between and among clinicians working on different patient care units.

Although dyadic refers to two points of communication, with one individual providing information and one individual receiving information, the process is not linear and occurs within the context of multiple, complex layers (Hilligoss et al., 2015). In general, the macro context provides the basis for communication within healthcare and may impact policies; the structural context recognizes communications at an organizational level, and recognizes hierarchal levels that may exist in the organization, the organizational culture and organizational routines and practices; and then the negotiation context considers communication at an individual level (see Figure 2). Typically at the negotiation context level, there is a power balance that develops between the two individuals. The perception of this power balance by both parties is critical to the effectiveness of communications. Individuals who perceive less power tend to demonstrate avoidance behaviors, leading to delayed communications and reduced knowledge sharing and those who perceive power dominance can be lead to an overbearing communication style (Hilligoss & Cohen, 2013).

This theory fits well when attempting to understand and improve ED-to-inpatient communication. With this DNP project, there was a concern that handoff reports lacked a shared

understanding of workflow and agreed upon process, which results in a delay of care. While the majority of the handoff literature centered on the handoffs between physicians, nursing handoffs occur with every shift change and departmental transfer, resulting in the same communication complexities, including the relationship among parties and perceptions of power distribution. Nurses in the ED provide patient information during the handoff process to nurses in the inpatient units. During this process, there can be a perceived power inequity between nurses in these two sub-cultures, resulting in the development of mental stereotypes among individuals that inform communications (Hilligoss et al., 2015).

Often ED nurses are seen, and see themselves, as highly independent clinicians, with a wide breadth of knowledge and ability to care for patients with many different types of problems, at different levels of acuity, and often very quickly. Inpatient care nurses are often perceived, or stereotyped, by ED nurses as being more focused on caring, rather than complex patient problems and treatments. Emergency Department nurses are often perceived as being focused on the immediate patient complaint, rather than the patient as a whole. Inpatient nurses are very focused on pathology, but are also very specialized in their knowledge base. The result is discordant priorities between ED and inpatient RNs (C. Lawson, personal interview, September 13th, 2017). However, from an organizational standpoint, both hold equal power and occupy the same position in the organization, with the ED nurse having intimate knowledge of the patient because they are the first to provide care, yet the inpatient nurse has intimate knowledge of patients' recovery trajectory, and holds access to the use of the inpatient bed (Hilligoss et al., 2015). This perceived power difference and dynamic not only leads to ineffective, and sometimes hostile communications, but also an avoidance to give or take report, potentially extending the patient's ED length of stay longer than necessary (Hilligoss, 2013).

While helping to explain communication barriers, DPT in the context of the negotiation framework can also help facilitate improvement. As outlined in Figure 2, when both parties in the handoff process view their positions as equal and share a belief that ambiguities in the sharing of patient information can be mitigated, such as through handoff tools, then a more productive conversation can occur around the sharing of patient information (e.g. diagnosis, acuity, etc.), disposition, and care needs. By improving this communication process, as highlighted by Hilligoss et al. (2015), the outcomes could include improved quality/safety, resource use, costs, efficiencies, patient experience and staff satisfaction. Therefore, an improved process with standardized communication and behavioral expectations will improve the transfer of information and could also decrease the length of ED stay for patients with admission orders (Hilligoss et al. 2015).

The use of DPT does have some limitations. Besides not originating from a healthcare perspective, the theory is predicated on a consistent dyadic team (e.g., husband and wife). In healthcare, personnel change several times a day. The communication that occurs typically includes very little consistency among individuals. Although a standardized process may be developed to promote mutual understanding during communication, there was a risk that some individuals would not be aware of these agreements and/or not adhere to them. Since communication is a continuous feedback loop, such noncompliance/failures could cause a reversal to baseline stereotypes and the use of ineffective communication styles (Hilligoss et al., 2015). Continuous monitoring of compliance to agreed-upon process and behaviors will be paramount to sustain improvement.

Chapter Summary

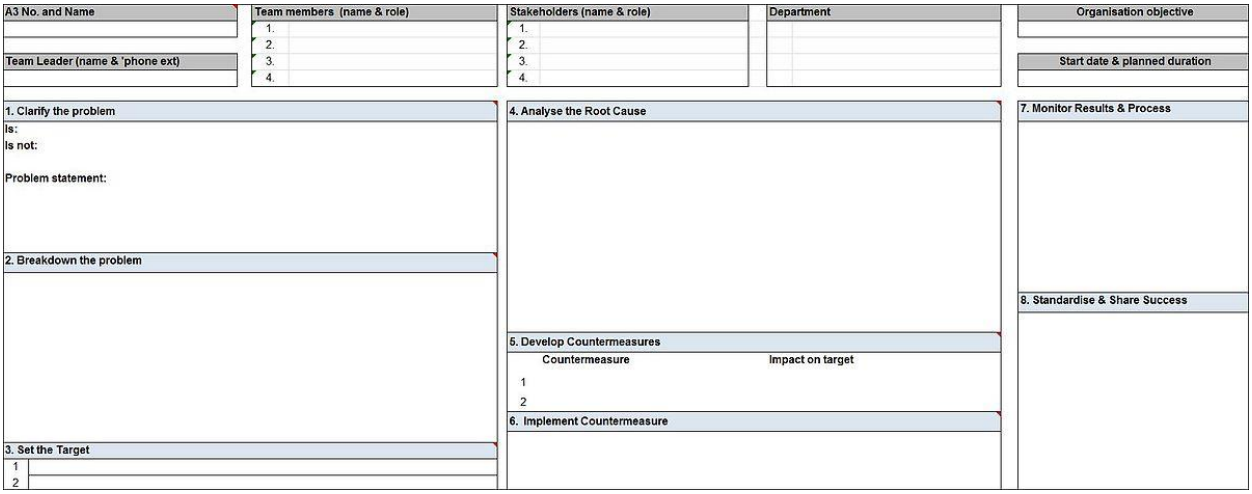
Communication in healthcare is very complex, due to the nature of patients and the care they require. Within organizations, each individual clinician maintains his or her own agenda, perspective of the other party, and understanding of information that is important to communicate (Dunbar, 2004). The use of DPT provides context for addressing the many layers of such complex communications (Rollins & Bahr, 1976). Dyadic Power Theory fosters understanding of power distribution and stereotyping, to acknowledge and address issues related to the use of communication tools (Hilligoss et al., 2015). Such understanding and knowledge was necessary for this DNP project to avoid making assumptions that could further lead to non-beneficial, or even regressive, behaviors and results. The value of DPT as a theoretical framework for this project was that it could foster the understanding that ED and inpatient RNs hold equal power by virtue of their formal positions, but different perspectives and stereotypes of each other. Fostering their ability to work together to improve handoff processes could improve communications and avoid the development of uninformed assumptions, stereotypes, and behaviors toward each other.

CHAPTER 4: METHODS

Chapter Introduction

This DNP quality improvement project used Lean principles, specifically A3, to create standardized tools for ED to inpatient handoff communications and a consistent ED to inpatient process in order to improve patient flow and decrease ED LOS and admission wait time. The A3 tool (see Figure 3) provided a roadmap to systematically work through this improvement project.

Figure 3. A3 Tracking Form (Kenney, 2011)



Project Design

In this approach, a quality improvement (QI) team representing every inpatient, observation and emergency department nursing service line at the University of North Carolina Medical Center (UNCMC) worked together to identify the problem, metrics, the current and target states, process gaps and root causes, solutions to address gaps, implementation action plans for solutions, monitor the impact of the action plan, and standardize the process for sustainability.

Setting

The UNCMC, located in Chapel Hill, NC, is a Level I academic hospital with over 900 beds. UNCMC has received Magnet designation from the American Nurses Credentialing Center (ANCC), which acknowledges the benefits of hospitals that align nursing strategic goals with patient outcomes and empower nurses closest to patient care to drive improvements (ANCC, n.d.). There are eight clinical nursing service lines at UNCMC (Medicine, Oncology, Surgery, Heart and Vascular, Women's, Children's, Psychiatry, and Emergency Services) within which 38 inpatient nursing units and two observation units are distributed. The Emergency Department at UNCMC, Chapel Hill, is a 92-bed department that employs approximately 150 nurses and sees approximately 70,000 visits annually. About 30% of these visits get admitted to an inpatient unit, resulting in approximately 1650 admissions per month (UNC School of Medicine, 2016). There are also two short-stay observation units that are part of Emergency Services.

UNCMC also has a campus located in Hillsborough, NC, approximately ten miles away from the main campus. The Hillsborough campus, while located away from main campus, is considered part of UNCMC and was included in this project. The Hillsborough campus consists of a 10-bed ED and three inpatient nursing units that focus on the care of adult patients for the local Hillsborough community. In total, UNCMC employed approximately 2,500 inpatient and ED Registered Nurses during the project period (UNC Health Care, 2018).

Intervention

This project used A3 methodology (see Figure 3) to bring together a QI team from all nursing departments scoped into this project. This process involved the Emergency Department at UNCMC-Chapel Hill campus, ED at UNCMC-Hillsborough campus, and inpatient service lines, including Medicine, Oncology, Surgery, Heart and Vascular, Women's, Children's,

Psychiatry, and Hillsborough campus inpatient. Each service area, including Hillsborough, was represented by a staff nurse, with two representing the Emergency Department. In addition, there was a representative from the House Administrative Supervisors and flex float staff.

The QI team first met on Thursday, June 21, 2018 and then every two weeks through Thursday, August 2, 2018. During this time, an eight-step process was used, as outlined in Table 1. The first step involved identifying the problem and importance, specifically the longer ED LOS and admission wait time compared to community norm for patients being admitted. All inpatient units, observation units and the ED at the two UNCMC campuses (Chapel Hill and Hillsborough) were scoped in (see Table 2). The second step involved having the QI team map the current state, identifying waste and redundancies. This step also included the team describing and mapping the target state. In the third step, the team set the improvement targets. After much discussion, the team felt improvements in ED to inpatient handoff could help in reducing ED LOS for admitted patients and admit wait time by at least two minutes. In addition, the team felt the length of time from first report attempt to patient arrival could decrease by five minutes and the length of time verbal report took could be improved by at least one minute. In the fourth step,

Table 1. Steps in the A3 Methodology (Kenney, 2011)

Step 1. Clarify the problem
• Develop a problem statement - state how the problem impacts the organization • Baseline data supporting the problem statement • Define the boarders of the problem (i.e. in and out of scope)
Step 2. Break down the problem
• Using words, visuals, etc., map out current process and identify waste • Using words, visuals, etc., create an ideal state
Step 3. Primary outcome targets
• Based on baseline data, team develops improvement goals • Goal should be specific, measurable, attainable, relevant, and timely
Step 4. Root cause analysis
• Use root cause analysis (RCA) tools, such as fishbone diagram, 5-Why technique, & Pareto charts to drill down to foundational causes of the problem, as outlined in the problem statement
Step 5. Countermeasures
• Based on identified root causes, the development of improvements to target reach root cause (i.e. process steps).
Step 6. Implementation
• A list of discrete action items that will lead to improvements • Should include a timeline, ownership, and expected outcomes • Each action item will have a concurrent measuring process
Step 7. Monitor results and processes
• Compliance with each process step will be monitored on a routine basis • Outcome metric(s) will be monitored on a routine and regular basis
Step 8. Sustainability and spread
• Team will identify a sustainability plan • Depending upon applicability, action items can be spread across organization/system

Table 2. Project Charter

Problem Statement
The UNCMC average ED LOS for admitted patients is approximately 500 minutes, compared with the national average of 336 minutes. The average admit wait time for admission is approximately 150 minutes, compared to the national average of 137 minutes.
Importance Statement
This lack of a standard process introduces delays in care and inefficient use of ED and inpatient beds.
Scope
Nursing staff at UNCMC Emergency Department, UNC Hillsborough Emergency Department, UNCMC inpatient units, UNCMC Hillsborough inpatient units, UNCMC observation unit, UNCMC Hillsborough observation unit; patient handoff

through brainstorming, the team identified key gaps that were preventing them from reaching or being at the target state. Using the 5-Why technique (Kenny, 2011), the team identified the root causes of identified barriers. With the 5-Why technique, for each identified barrier, the team first asked, "Why does this barrier exist?" Each response was followed by another "why" question until an identified root cause was agreed-upon (Kenny, 2011). In step five, solutions were discussed that targeted each gap, based on the response to the first "why" question in the root-cause analysis process. For the solution approach, for every identified root cause, the team asked the question "if we", followed by "then we", to help guide the development of countermeasures (i.e. interventions).

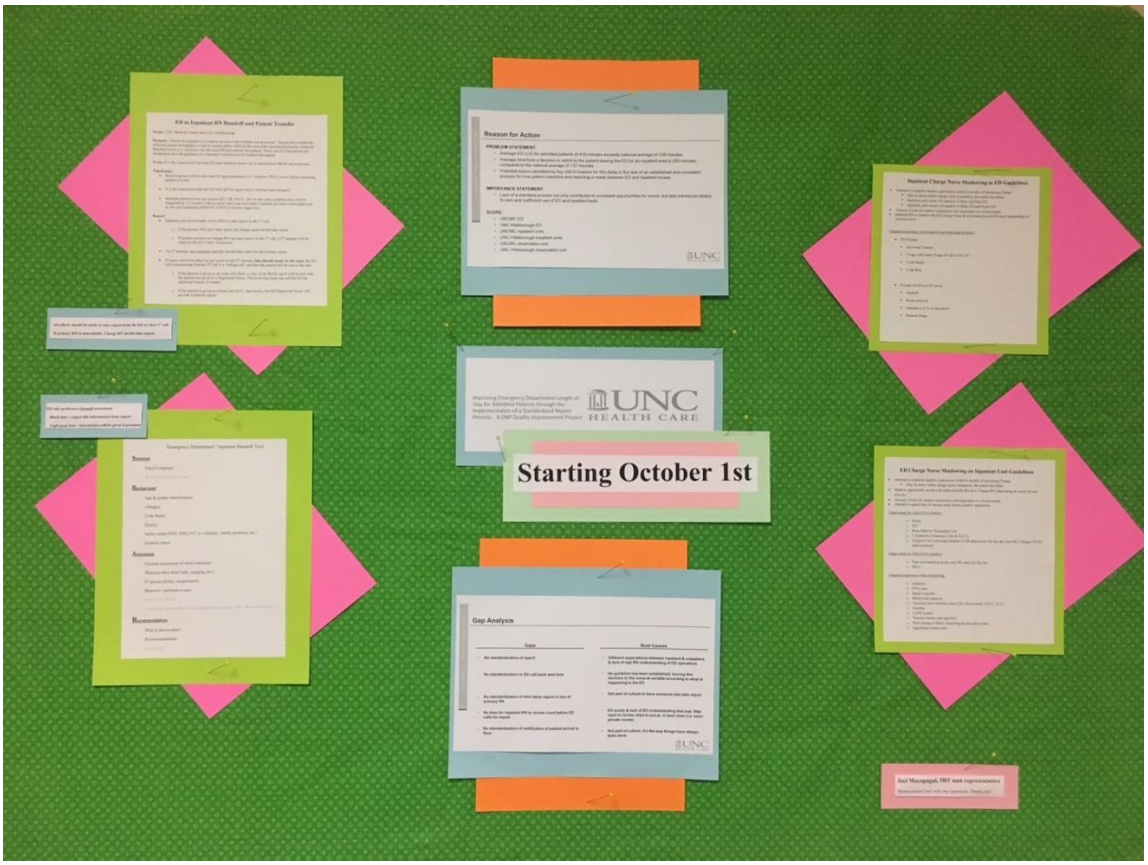
In step six, the QI team took these identified countermeasures/interventions and developed tools to target the identified solution and to implement appropriate tools across service lines. From this approach, four tools were created to help reach the target state. The QI team was divided into two groups. One group developed two of the four tools and the other group developed the other two tools. After the initial development of each tool, the QI came back together, reviewed each tool, provided group input and came to agreement on the final products. These tools, discussed more thoroughly in Chapter 5, included: 1) ED to Inpatient Handoff Guideline (see Appendix B); 2) Situation, Background, Assessment, Recommendations (SBAR) Communication Tool (see Appendix C); 3) Inpatient Charge Nurse Shadow Guideline (see Appendix D); and 4) ED Charge Nurse Shadow Guideline (see Appendix E). Once these tools were developed, they were presented to UNCMC nursing leadership, which included all Nursing Directors, the Chief Nurse Officer, and the Associate Chief Nurse Officer. All tools were approved by the leadership team to move forward in the process. The Project Lead (PL) then brought the tools to all Nurse Managers in the Division of Nursing, and led a focused discussion

of the project, tools and next steps. All Nurse Managers supported the project and presented tools, and worked together to agree on a deployment plan (see Table 3). Each service line representative explored the implementation of the tools in their respective areas. All tools were used ubiquitously across the Division of Nursing, except for the shadowing guidelines, which were only implemented in the appropriate area. Specifically, inpatient nursing implemented the inpatient charge nurse shadowing guidelines and the ED implemented the ED charge nurse shadowing guidelines. Each unit also identified a unit-champion to assist with deployment. Education on all tools began in September 1st 2018, and all tools were implemented on October 1st, 2018. Education occurred via Weekly Updates, staff meetings, and unit education boards (see Figure 4).

Table 3. Deployment Plan

Each unit identified a champion to help deploy
Each representative from the QI team from each service was available as a resource
Unit champion rolled-out tool and provided education at the unit level
Units provided education to tools in September via huddles, staff meetings & Weekly Updates
Each unit displayed QI project information and tools on a bulletin board in the unit
Go-live October 1st, 2018

Figure 4. Unit Education Board



In step seven, data were distributed across the Division of Nursing monthly on ED LOS for admitted patients, ED admission wait time, average time from attempt of first report to patient arrival and length of time for verbal report. In addition, data on transfer time from first report attempt to patient admission to unit and length of time for report was distributed throughout the Division of Nursing via email, monthly Nurse Manager meetings, and staff meetings. In step eight, sustainability, the PL, QI team, unit champions, and unit nurse managers monitored data distributed, highlighted successful stories related to the use of tools and established processes, and worked with UNCMC nursing leadership to address any reported process deviations. The developed ED to Inpatient Guideline began being developed into an official Division of Nursing policy. In addition, shadowing for charge nurses from both inpatient

units and the ED was also implemented in October 2018. Although this intervention is not expected to have immediate impact, it is a key element to ensuring sustainability. Additionally, continuous feedback on the implementation process was solicited from Nursing Directors, Nurse Managers, the QI team, and unit-champions.

Population/Sample

As a Level I academic trauma hospital, patients of all ages and acuity levels access the ED. This quality improvement project focused on standardizing patient reporting and monitoring ED LOS for all patients admitted to an inpatient unit, which was approximately 1,650 patients per month at the start of this project. This QI project involved all UNCMC ED and inpatient nursing units and staff.

Data Collection

The primary outcome metric monitored in this project was ED LOS for all patients admitted to inpatient units, measured as the average time in minutes for total time an admitted patient was in the ED. The secondary outcome metric was the admission wait time, defined as the time in minutes from decision to admit a patient to an inpatient unit to the patient arriving to an inpatient unit. These data were collected through the electronic healthcare record data warehouse. In addition, the QI team collected data on the length of time, in minutes, from the first report attempt by the ED RN to patient arrival to the inpatient unit, the number of calls made to an inpatient unit before a handoff was communicated between ED and inpatient nursing staff, and the number of minutes required for verbal report (or handoff). These data were collected manually through a convenience sample on units where QI team members worked for a period of one month before implementation and two months after the implementation of developed tools.

Ethics and Human Subjects

Prior to implementation, this quality improvement project was approved the UNCMC Nursing Research Council (May 23, 2018) (see Appendix F). Subsequently, the project was submitted to and approved by the University of North Carolina at Chapel Hill Institutional Review Board (IRB) on June 1, 2018 (see Appendix G). Because data collection was solely based on throughput and handoff time with no identifying patient information used, the project was approved as "exempt" by the IRB.

Data Analysis

The primary outcome metric for this project was ED length of stay (LOS) for admitted patients and the secondary outcome metric was wait time for admission, both measured as time in minutes. In order to account for seasonality, which affects ED volume and acuity, the months for comparison included September 2017, October 2017, November 2017, September 2018, October 2018, and November 2018. In order to evaluate data impacted by interventions within the scope of this project, LOS data was limited to patients in the ED less than 24 hours and admission wait time data was limited to patients in the ED less than 12 hours. An analysis of variance (ANOVA) was used to examine differences in outcomes at these six data points, with the significance value set at 0.05. With approximately 1650 inpatient admissions per month, this provides 80% power at 5% significance and an effect size of 0.002 (G. Knafl, personal communication, April 16th, 2018). In addition, data on transfer time for admitted patients, measured from length of time, in minutes, from first report attempt by the ED RN to patient arrival to the inpatient unit, was collected via convenience sample. This data was manually collected from QI team members and their RN work colleagues from their respective service lines. Data from Oncology, Medicine, Surgery, Children's, Heart and Vascular, and Women's service at UNCMC were obtained. Also, the length of time, in minutes, on how long verbal

report took was collected from the same manual data collection process and convenience sample. Both of these metrics (transfer time and report length) were analyzed using ANOVA at 5% significance. These data were collected manually in September 2018, the month prior to implementation of tools, October 2018, the month of implementation, and November 2018, the second month of implementation.

An important part of the A3 process is an assessment of what went well and what could be improved in the quality improvement process (Kenney, 2011). In that vein, members of the quality improvement team were sent an anonymous survey at the end of the project via SurveyMonkey® (October 2018) asking four questions: 1) What went well or helped?, 2) What didn't go well or can be improved?, 3) What will we do differently now?, and 4) How will we share lessons learned with others? The responses were reviewed for themes within and across the four questions.

Chapter Summary

This chapter reviewed the methods used to develop and implement a quality project for improving ED to inpatient handoff and the data analysis involved in helping to determine effects and outcomes. This project used Lean methodology to analyze current ED to inpatient admission and communication processes, and to develop new processes that would make the transition from ED to inpatient admissions more efficient, thus potentially decreasing ED LOS. The next chapter will present project results.

CHAPTER 5: RESULTS

Chapter Introduction

The purpose of this QI project was to collaborate with hospital stakeholders from multiple nursing service lines to develop and implement a process for improving the handoff process between nurses when admitting and transferring patients from the ED to inpatient units. The project was conducted using Lean methods, namely A3, to: clarify the problem, analyze the problem, identify target outcomes, perform a root cause analysis, identify countermeasures and interventions, implement improvement actions; monitor results, and sustain and spread the findings. This chapter presents the findings of the project that were derived by: mapping of the current process and the target state, identifying system barriers, describing root causes, examining key outcomes of the process, implementing unit-specific interventions, reporting of quantitative results related to interventions, and obtaining feedback about the project from the quality improvement team. The primary outcomes examined in this project were ED length of stay for admitted patients and wait time for admission once an admission order was placed (i.e., admit wait time). In addition, data on length of time from first admission report attempt to patient arrival on the unit and length of time verbal handoff report took were also examined.

Baseline Data

The number of patients admitted from the ED to an inpatient unit from September 1st, 2018 through September 30th, 2018, ranged from 1402 to 1694 per month, with an average of 1,585 admissions per month (see Table 4). Baseline length of stay for patients admitted from the ED to inpatient units during that same time period was an average 497 minutes, ranging on

average from 467 to 528 minutes per month. The average admission wait time (i.e., the time interval between entry of an admission order by an inpatient medical team for an ED patient and the patient's departure from the ED) was 154 minutes, with monthly averages ranging from 137 to 169 minutes (see Table 4).

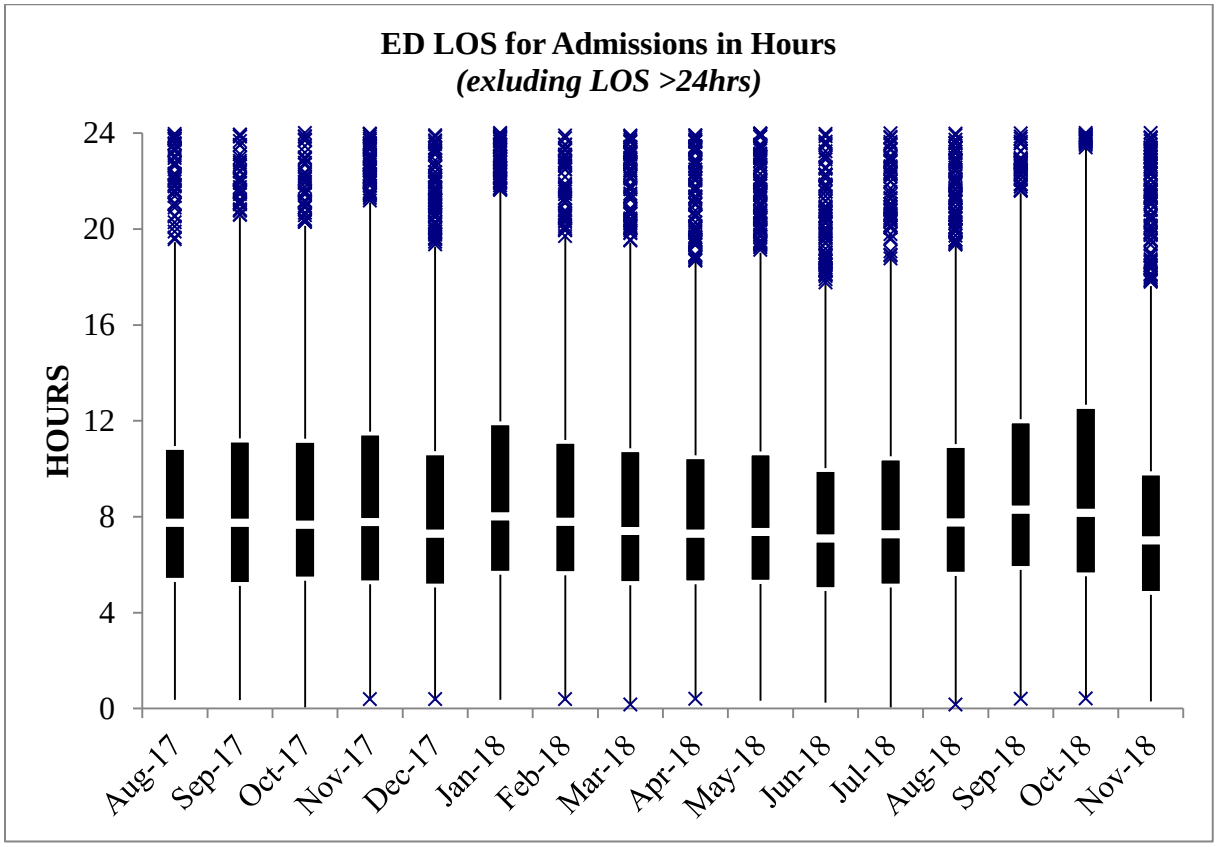
Table 4. ED Admissions, Patient Lengths of Stay (LOS), and Wait Times

Month	Admissions (N)	ED LOS (minutes)	Wait Time (minutes)
August 2017	1629	492	152
September 2017	1578	498	155
October 2017	1605	496	153
November 2017	1536	506	154
December 2017	1562	488	148
January 2018	1575	528	155
February 2018	1402	506	159
March 2018	1628	490	155
April 2018	1602	487	157
May 2018	1645	496	153
June 2018	1618	467	137
July 2018	1604	476	144
August 2018	1694	509	158
September 2018	1530	528	169
October 2018	1615	522	163
November 2018	1543	479	144

A box and whisker plot was used to assess variation of these baseline data. The box and whisker plot graphs data into four quartiles, with extreme values outside upper and lower quartile ranges represented by an "x" on the graph. Both ED to inpatient admission data and wait time for admission data had extreme outliers, sometimes extending to weeks, as opposed to hours. These extremes in variation are related to a multitude of factors outside of nursing's control, such as medical team availability and bed availability. Since this QI project was specific to the ED to inpatient process between nursing personnel, it was determined that ED LOS for admitted patients would be limited to 24 hours (see Figure 5) and admission wait time to 12 hours (see

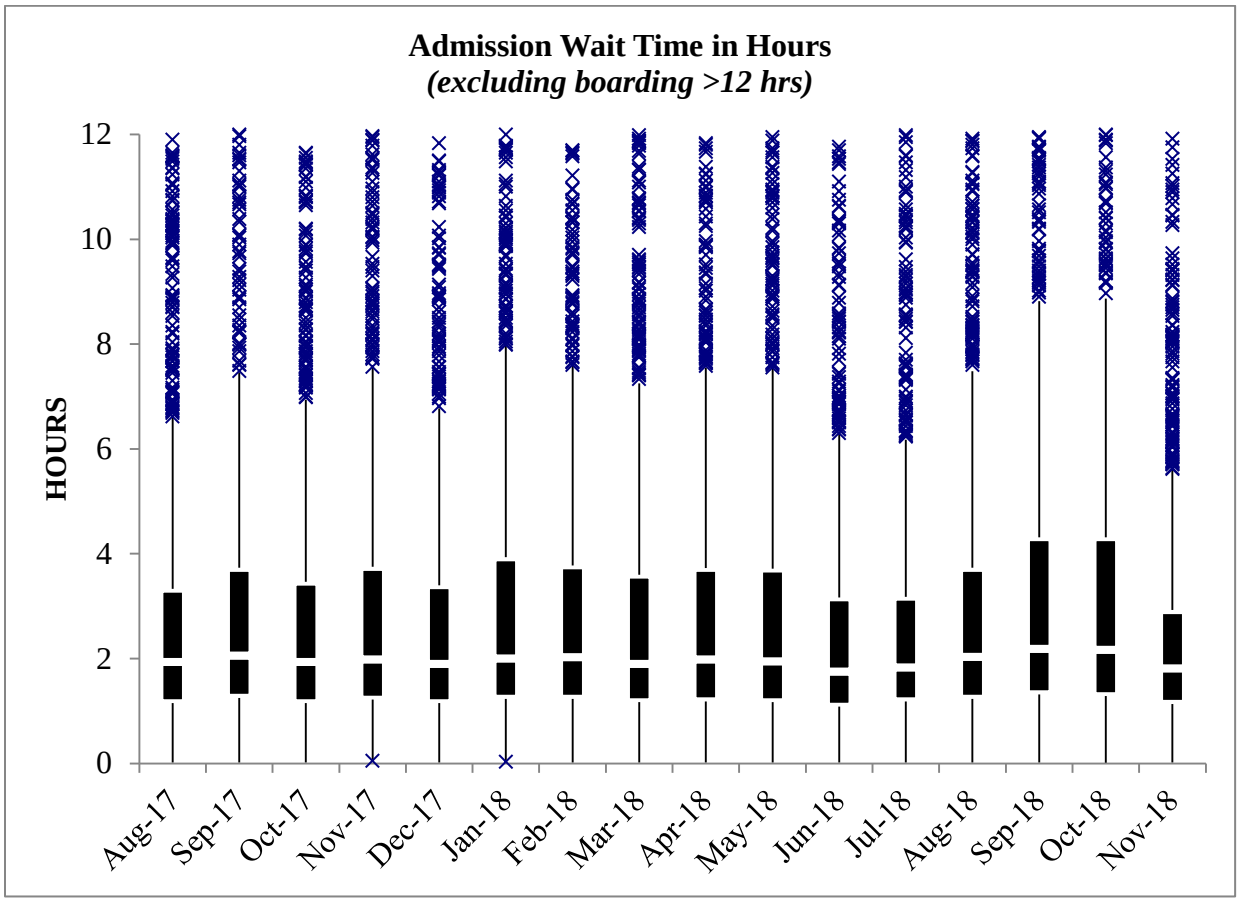
Figure 6), to allow visualization of data and data variation more relevant to the scope of this project. These time limits were chosen to allow for ED LOS and admission wait times that could be impacted by this project, as ED LOS and admission wait time are influenced by multiple variables outside of the scope of RN workflow. These graphs represent the mean time for ED LOS for admitted patients (Figure 5) and mean wait time for admission (Figure 6), the lowest two and highest two quartile ranges, with extreme values outside of quartile ranges represented by "x".

Figure 5. ED LOS for Admissions Box and Whisker Plot*



*Note: "x" indicates values outside of quartile ranges

Figure 6. Admission Wait Time Box and Whisker Plot*

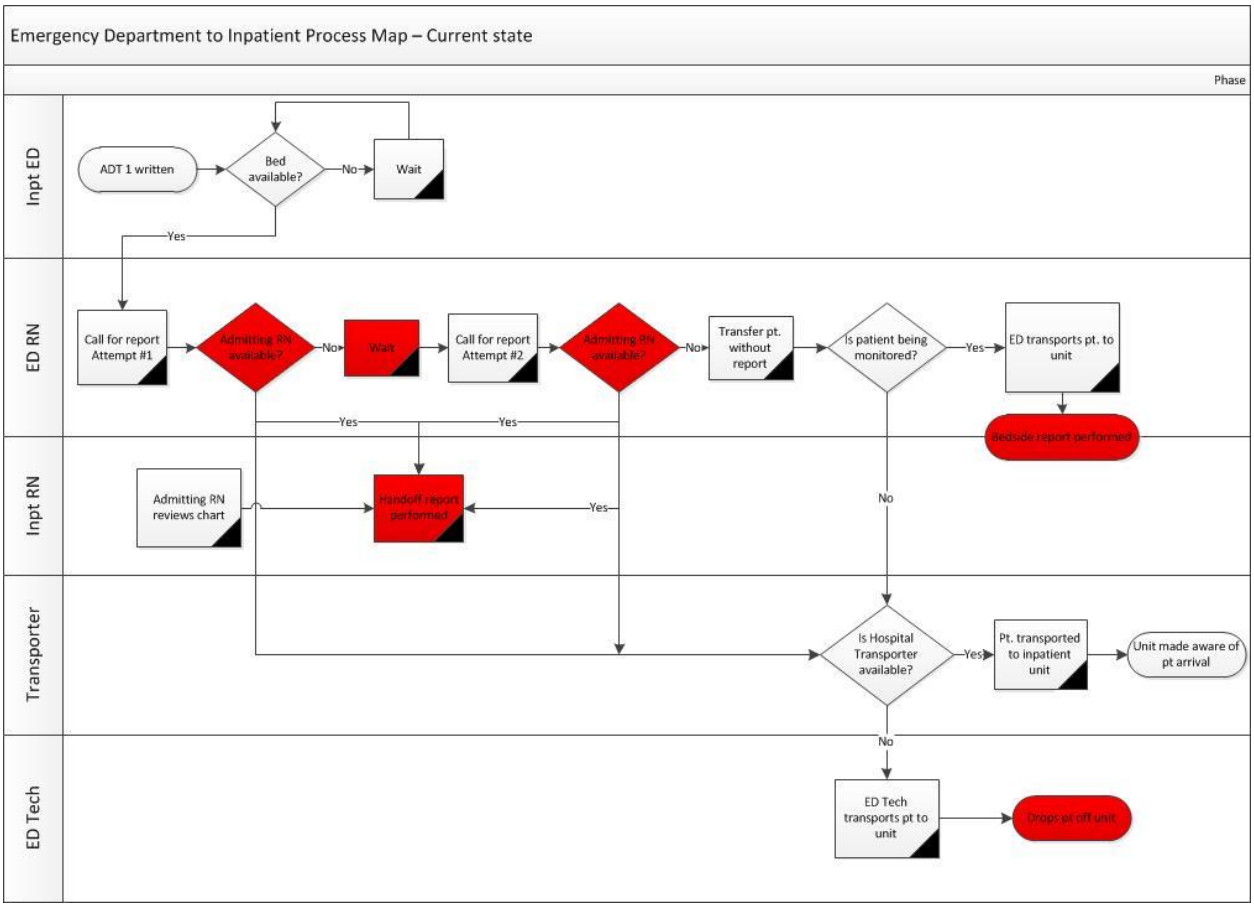


*Note: "x" indicates values outside of quartile ranges

A3 Methodology Results

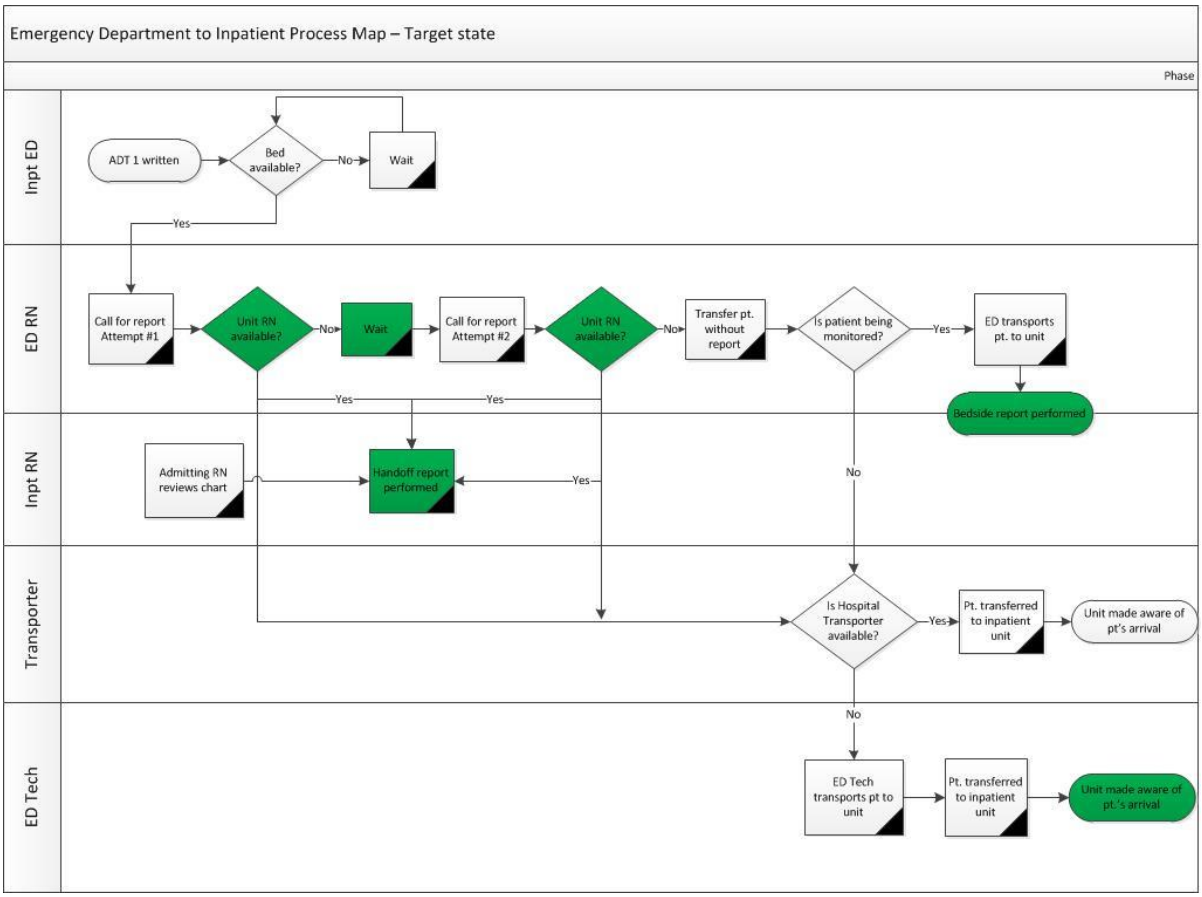
This project used A3 methodology (see Figure 3 and Table 1) to examine ED to inpatient handoffs between nurses. The quality improvement team first mapped out the current state of patient flow from ED to inpatient admission (see Figure 7), and then mapped a target, or desired, state of ED to inpatient admission flow (see Figure 8). In Figure 7, the decision points and steps in the process highlighted in red indicate gaps in consistent practices from nurse-to-nurse and department-to-department. In Figure 8, the green decision points and steps in the process indicate implementation of standard work and consistent practice.

Figure 7. Current State Process Map*



*Note: Red indicates gaps in standard work and variability in workflow

Figure 8. Target State Process Map*



*Note: Green indicates standard work

Once the team mapped current and target states, they then worked on identifying the main gaps in going from current to target state, as highlighted in red in Figure 7. In reviewing the current state, the QI team brainstormed reasons for not being able to achieve target state. Five main gaps were identified: 1) lack of standardized reporting; 2) lack of standardization in ED call-back wait time (i.e. how long does the ED wait to call back to give report if the inpatient RN is not available with the first call); 3) lack of standardization in who takes report if the primary inpatient nurse is still unavailable with the second call; 4) inadequate time for the inpatient RN to review the patient's chart to assess unit and bed appropriateness before ED calls to give patient admission report; and 5) lack of standardization in the notification of a patient's arrival to the

inpatient unit (see Table 5). Each gap was assessed using the "5-why" technique to identify the root cause of each gap (Kenney, 2011).

Table 5. Gaps and Root Causes

Gaps	Root Cause
1. No standardization of report	Different expectations between inpatient & ED, and lack of inpatient RN understanding of ED operations; differences in patient assessment (i.e. focused versus head-to-toe)
2. No standardization in ED call-back wait time	No guideline has been established, leaving this decision to the nurse & variable according to what is happening in the ED; lack of understanding each other's workflow
3. No standardization of who takes report in lieu of primary RN	Not part of culture to have someone else take report
4. No time for inpatient RN to review chart before ED calls for report	ED acuity and lack of ED understanding that inpatient RNs need to review chart to put patient in best room; lack of understanding each other's workflow
5. No standardization of notification of patient arrival to floor	Not part of culture; it's the way things have always been done

Solutions were then developed to address each gap and root cause (see Table 6). From this approach, it was determined that four tools were needed to help reach the target state (see Table 7). To facilitate the development of these tools and spread the work, the QI team was divided evenly into two groups, with one ED staff member on each group to ensure the ED perspective. One group developed two of the four tools and the other group developed the other two tools. After the initial development of each tool, the QI came back together, reviewed each tool, provided group input and came to agreement on the final products.

Table 6. Solution Approach

Gap Number	Solution *(if we)*	Outcome *(then we)*
1	Have new CN orientation to include ED & inpatient shadowing	Create more mutual understanding of work environment & flow
1	Provide SBAR education for both inpatient & ED nurses, to include key points of isolation & PNA	Will have inpatient & ED nurses communication in a more uniform process
2	Standardize call-back time to 10 min	Will have a consistent call-back expectation
3	Create an expectation that if the primary RN or CN cannot take report on the 1st call, then any available RN will take report on the 2nd call	Will have a consistent expectation of who will take report.
4	Have patients pre-assigned to a unit	Then the unit will have time to review the chart for room-specific needs (i.e., isolation) before the ED calls for report
5	Have ED nursing assistants notify an RN once they arrive on the unit with a patient	The unit and RN will know when a patient has arrived in a bed

Table 7. Developed Tools for Each Gap

Developed Tools	Addressed Gap(s)
ED to Inpatient Handoff Guideline	2, 3, 4, 5
SBAR Communication Tool	1
ED Charge Nurse Shadowing Guideline	1, 2, 3, 4, 5
Inpatient Charge Nurse Shadowing Guideline	1, 2, 3, 5

The Emergency Department to Inpatient Handoff Guideline was developed to provide consistent expectations when admitting a patient from the ED to an inpatient unit (see Appendix B). These guidelines standardize call-back times (i.e. how long the ED nurse should wait before attempting to call report if the inpatient RN is not available during first call) for ED staff and

create an expectation that if the primary inpatient RN or charge nurse (CN) on the inpatient unit is unavailable to take report on the first call, then any available inpatient RN will take report on the second call. It also establishes an expectation that the ED nursing assistant (NA) who may transport the patient to the unit will notify an inpatient RN that the patient had arrived, a practice not previously performed (see Table 5, Table 6, and Table 7).

The Situation, Background, Assessment, and Recommendations Communication Tool was developed (see Appendix C) was identified in the review of literature as a mechanism to facilitate a shared understanding of patient needs and standardize key discussion points (Brannen et al., 2009). A unique component with this tool was the creation of must-discuss and nice-to-know discussion points. As indicated on the tool, bold-font items are items that must be discussed (i.e. chief complaint, isolation needs, etc.), and the lower-font items need to be discussed only if applicable to a particular patient - diet, wounds, etc. (see Table 5, Table 6 and Table 7).

A common thread in the identified gaps and root causes was a gap in understanding the workflow of the ED versus inpatient units (see Table 5, Table 6 and Table 7). For example, the ED nurse performs focused assessments specific to patients' chief complaint, and inpatient nurses perform head-to-toe patient assessments, but they lack an overall understanding of each other's workflow. This difference in understanding about the types of assessments completed can create frustrations during the giving and receiving report, especially when inpatient nurses ask specific patient information that ED nurses do not have. Subsequently, two shadowing guidelines were created: one for inpatient CN to shadow in the ED (see Appendix D), and one for the ED CN to shadow in inpatient units (see Appendix E). The goal is for each nursing area to have a better understanding of their colleagues' respective workflows and work environments. Although

important tools, their effectiveness was not measurable for the purposes of this project because of the project's timeline. However, the guidelines were developed and designed to improve ED RN and inpatient RN relations for the long-term, and will be available for use in the future.

The gap of the inpatient RN lacking sufficient time to review the patient's chart for appropriateness before the ED calls to provide a patient report was addressed through the ED to Inpatient Handoff Guideline and through the development a secondary, but related, project. The secondary project created a process for the Patient Logistics Center (PLC), a department formed in 2017 that began facilitating internal patient movement in August 2018, to assign an ED patient to an inpatient nursing unit. Once assigned, the nursing unit would assign the patient a specific room and nurse, thus providing the unit time to review the patient's chart before the patient is assigned to a bed. This secondary process change allows the inpatient unit to review the patient's chart for unit appropriateness, assign the patient to a specific bed, and notify the ED nurse to call report for the inpatient admission.

Tool Implementation Results

An analysis of variances (ANOVA) was performed for the main outcome metrics of ED LOS and ED wait time for six points in time. To account for seasonality, which affects ED volume and patient acuity, the months for comparison were September 2017, October 2017, November 2017, September 2018, October 2018, and November 2018. The purpose of the ANOVA was to compare pre- and post-intervention of the tools, specifically ED to Inpatient Handoff Guideline and SBAR Communication Tool, across and among these six months. Analysis revealed no statistical difference between these six data points for either ED LOS or wait time (see Table 8 and 9). Thus, the main outcome metrics, ED LOS for admitted patients and admission wait time, were not impacted by the implementation of the tools.

Table 8. ED Length of Stay ANOVA for Inpatient Admission

Month	Comparison Month	Significance
September 2017	October 2017	0.193
	November 2017	0.977
	September 2018	0.051
	October 2018	0.281
	November 2018	0.051
October 2017	November 2017	0.924
	September 2018	0.051
	October 2018	0.051
	November 2018	0.055
November 2017	September 20018	0.281
	October 2018	0.635
	November 2018	0.053
September 2018	October 2018	0.931
	November 2018	0.054
October 2018	November 2018	0.051

Table 9. ED Wait Time for Admission ANOVA

Month	Comparison Month	Significance
September 2017	October 2017	0.983
	November 2017	0.853
	September 2018	0.123
	October 2018	0.461
	November 2018	0.052
October 2017	November 2017	0.542
	September 2018	0.051
	October 2018	0.153
	November 2018	0.051
November 2017	September 20018	0.113
	October 2018	0.339
	November 2018	0.051
September 2018	October 2018	0.559
	November 2018	0.053
October 2018	November 2018	0.051

Before the tools were implemented in September 2018, the QI team obtained baseline data on transfer time from first report attempt to patient arrival to unit, length of time for verbal report between ED and inpatient RNs and the number of attempts made by ED staff to call for report to inpatient unit staff. The same data were collected in October and November 2018. These data were obtained manually from the QI team's respective nursing units. A total of 106

admissions were documented before the implementation of the QI tools. Of these 106 admissions, 97 had complete data on transfer time from first report attempt to patient arrival on the inpatient unit, and all 106 admissions had complete data on length of time for verbal report. A total of 76 admissions were documented after the implementation of tools in October 2018. Of these 76 admissions, 71 had complete data on transfer time from first report attempt to patient arrival. All 76 contained data on length of time for verbal report. A total of 35 admissions were documented after implementation of tools in November 2018. Of these 35 admissions all had completed data on transfer time from first report attempt to patient arrival and length of time for verbal report (see Tables 10 and 11).

Table 10. Transfer Time from First Report Attempt to Patient Arrival

	Admissions	Time (minutes)	SD
September 2018	97	30.5	18.2
October 2018	71	24.2	8.8
November 2018	35	21.7	7.4

Table 11. Length of Verbal Report and Attempts

	Verbal report	Time (min)	SD	Attempts > 1	Attempts > 2
September 2018	106	3.8	1.6	10	0
October 2018	76	2.8	1.2	3	0
November 2018	35	3.1	1.3	2	0

The average time from first report attempt to patient arrival before implementation of tools (N=97) was 30.5 minutes (SD=18.2). The average time from first report attempt to patient arrival after implementation of the tools in October 2018 (N=71) was 24.2 minutes (SD=8.8).

The average time from first report attempt to patient arrival after implementation of the tools in November 2018 (N=35) was 21.7 minutes (SD=7.4). An ANOVA comparing these metrics was statistically significant at p=0.000 for the months following implementation of tools (see Table 10 and 12). This suggests that the implemented tools, specifically the ED to Inpatient Handoff Guidelines and SBAR Communication Tool, provided the standard work necessary to decrease the time used for patient transfers from the ED to inpatient units.

Table 12. First Report Attempt to Patient Arrival ANOVA

Month	Comparison Month	Significance
September 2018	October 2018	0.000
	November 2018	0.000
October 2018	November 2018	0.664

The average length of time for verbal report before implementation of tools (N=106) was 3.8 minutes (SD=1.6). The average length of time for verbal report after implementation of tools in October 2018 (N=76) was 2.8 minutes (SD=1.2). The average length of time for verbal report after implementation of tools in November 2018 (N=35) was 3.1 minutes (SD=1.3). An ANOVA comparing these metrics was statistically significant at $p<0.05$ for the months following implementation of tools (see Table 11 and 13). This suggests that the implementation of tools, specifically the SBAR Communication Tool, facilitated verbal report between the ED and inpatient RN enough that the time needed for report decreased.

Table 13. Length of Verbal Report ANOVA

Month	Comparison Month	Significance
September 2018	October 2018	0.000
	November 2018	0.048
October 2018	November 2018	0.371

In addition, the number of report attempts decreased between pre and post implementation of tools. Of the data collected pre implementation, there were 10 attempts (out of 106 admissions), or approximately 9.4% of the time, when the ED RN had to call an inpatient nursing unit more than once to provide patient report. Of the data collected post implementation of tools, the ED needed to call inpatient nursing units more than once for report only three times out of 76 admissions in October 2018, or approximately 3.9% of the time and twice in November 2018, or approximately 5.7% (see Table 11). This finding suggests that the implemented tools, specifically the ED to Inpatient Handoff Guideline, provided the standard work necessary to decrease the need for multiple report attempts.

Project Insights

An important step in any QI project includes soliciting feedback (Kenney, 2011). All thirteen members of the QI team were sent an anonymous survey containing four feedback questions via Survey Monkey®. These questions were: 1) What went well or helped?; 2) What didn't go well or can be improved?; 3) What will we do differently now?; and 4) How will we share lessons learned with others? Of the thirteen QI members sent the survey, almost half (N=6) responded to the survey. The responses to each question are provided in Appendix H. The main theme of responses to question #1 related to the value of collaborating on this project with peers across service lines, especially with representatives from the ED. For question #2, the main theme focused on garnering wider hospital engagement in the ED to inpatient patient admissions

process to help ensure that the tools are implemented consistently. The main theme for question #3 was excitement/enthusiasm about having a standard work flow for ED to inpatient nurse handoffs and patient admissions. Lastly, for question #4, the major themes focused on the dialogue that this project created at the unit level about differences in ED and inpatient workflows, and the perspective that this project was a mechanism for helping both the ED and inpatient unit staff appreciate each other's work environments. Overall, the responses about the project were very positive as a whole, highlighting the importance of the problem addressed, and the excitement that can be generated around the execution of the project that creates a standard process. There were also comments suggesting improvements, such as having more ED representation on the QI team, and continued focus of the tools beyond November 2018.

Chapter Summary

The results of this project are threefold. First, the A3 methodology led the team to create specific tools to help improve the ED to inpatient handoff process. For this QI project, these tools included an ED to Inpatient Guideline, an SBAR Communication Report Tool, and shadowing guidelines for both ED and inpatient RNs. Second, quantitative data for this project did not demonstrate significant improvements in ED LOS or ED wait time. However, the time from first report attempt to patient arrival on the unit decreased from 30.5 minutes to 24.2 minutes and 21.7 minutes ($p=0.000$). In addition, the time for giving/receiving report for ED to inpatient admissions was reduced, on average, by one minute, decreasing from 3.8 minutes to 2.8 minutes and 3.1 minutes ($p<0.05$). There was also a narrowing of standard deviation for both time from first report attempt to patient arrival and verbal report pre and post implementation. These findings suggest that there is less variability patient to patient in the transfer and report process.

Finally, the QI team highlighted the impact of this project as being the importance of creating a standardized process, and improving mutual understanding among staff on inpatient units and in the Emergency Department. In the next chapter, a more thorough discussion of findings will be provided.

CHAPTER 6: DISCUSSION

The purpose of this quality improvement project was to implement a standardized, evidence-based ED-to-inpatient RN handoff process to improve flow and decrease ED patients' lengths of stay and wait time prior to inpatient admission. As stated in Chapter 4, a quality improvement team used A3 methodology to develop tools to improve ED to inpatient admissions. Four tools were developed: 1) ED to Inpatient Handoff Guideline, 2) Situation, Background, Assessment, Recommendation (SBAR) Communication Tool, 3) ED Charge Nurse Shadowing Guideline, and 4) Inpatient Charge Nurse Shadowing Guideline. As outlined in Chapter 5, ANOVA was used for ED LOS and admission wait time for September, October, and November the year prior to implementation, one month prior to implementation, and two months following implementation of tools. In addition, ANOVA was used to compare patient transfer time and length of time to give/receive report pre versus post implementation of tools. Members of the QI team were surveyed on strengths and weaknesses of the project and its implementation. This chapter provides an interpretation of the findings and discusses implications for the future, both for nursing as a profession and UNCMC specifically.

Discussion of Findings

Due to the nature of patients and the care they require, communication in healthcare is very complex. Within organizations, each individual clinician maintains his or her own agenda, perspective of the other party, and understanding of information that is important to communicate. This reality of clinical practice often results in discordant priorities and inefficient communication. As discussed by Dunbar (2004), the Dyadic Power Theory can be used to frame

concerns around communication when there is a lack of shared understanding, which can result in inefficient communication and frustration. Hilligoss et al. (2015) expanded this concept into the world of healthcare. As outlined in Figure 2, when ambiguities in the handoff processes are mitigated, then a more productive conversation can occur around the sharing of patient information (e.g. diagnosis, acuity, etc.), disposition, and care needs. By improving this communication process, there could be improved quality/safety, resource use, cost, efficiencies, patient experience and staff satisfaction.

This framework fits well when attempting to understand and improve ED-to-inpatient communication. With this DNP project, there was a concern that the ED to inpatient handoff process lacked a shared understanding of workflow and agreed upon processes, which was resulting in unnecessarily protracted ED LOS and admission wait time. Therefore, an improved process, with standardized behavioral expectations and communication may improve the transfer of information and could also potentially decrease the length of ED stay and admission wait time for patients with admission orders (Hilligoss et al., 2015).

To achieve a standardized process, the literature supports use of Lean principles (Kenney, 2011; Klee et al., 2012; Leggat et al., 2016; Sorrentino, 2016). Specifically, A3 Lean methodology was used as a roadmap to systematically guide this quality improvement work. The advantage of A3 methodology is that it provides a step-by-step process to identify the problem, the metrics, the current and target states, process gaps and root causes, solutions to address gaps, implementation action plans for solutions, monitor the impact of the action plan, and standardize the process for sustainability (Kenney, 2011).

The use of the A3 methodology resulted in the development of four tools: 1) ED to Inpatient Guideline, 2) SBAR Communication Tool, 3) ED Charge Nurse Shadowing Guideline,

and 4) Inpatient Charge Nurse Shadowing Guideline. These tools were implemented throughout the project site in October 2018. The primary purpose of the ED to Inpatient Guideline (see Appendix B) and the SBAR Communication tool (see Appendix C) was to standardize the patient transfer and ED RN to inpatient RN communication process (see Table 6). By making this process more efficient, the intent was that the ED LOS for patients being admitted and wait time for admission would decrease.

Analysis of variances (ANOVA) was used to compare ED LOS and admission wait time among six months: September 2017, October 2017, and November 2017 (one year prior to project implementation), September 2018 (one month prior to project implementation), and October and November 2018 (the months of project implementation). This approach was used to account for patient acuity and volume seasonality in the Emergency Department. Neither ED LOS nor wait time for admission decreased significantly ($p>0.05$) (see Table 4, Table 8 and Table 9). These results indicate that the ED to Inpatient Handoff Guideline and SBAR Communication Tool did not contribute to decreased time the patient spent in the ED for patients being admitted.

However, the interpretation of this finding is convoluted, as there are many variables that contribute to the amount of time a patient spends in the ED. These include waiting for a bed to be cleaned and needing a test and/or procedure before admission - variables outside of the control of the ED RN or inpatient RN. Additionally, the implementation of the Patient Logistics Center (PLC), which in August 2018 began to assign ED patients to units, and then units assigning patients to specific beds, may have contributed to an unchanged ED LOS and admission wait time for this project. While this PLC process, which was implemented during the same time as the developed tools were implemented, has the advantage of providing inpatient units time to

review the patient's chart for appropriateness (i.e. infection control needs and personal nursing assistant needs, etc.), it may also increase ED LOS and admission wait time for patients being admitted, as there is now an extra step to wait for the inpatient unit to assign the ED patient a bed and nurse.

Despite these results, there was an indication that the ED to Inpatient Handoff Guideline (see Appendix B) improved processes. While developing current and ideal states (see Figures 7 and 8), it was identified that there was a lack of standard work existed for the number and extent of times the ED RN should to call back for report if the admitting inpatient RN was not available with the first call. Further, there was not a standard process on what to do if that inpatient RN was unavailable during the second call. These ambiguities were addressed in the ED to Inpatient Handoff Guideline, which outlines that the ED RN should call back to the inpatient unit within ten minutes if report cannot be taken on the first call. Further, it specifies that any RN should take report on the second call, and if report still cannot be obtained, the patient would be brought to the unit by either the ED RN or by the ED NA with a written report. Analysis of data obtained at the unit level demonstrates that the frequency of more than one report attempt decreased from 9.4% before the guideline was implemented to 3.9% and 5.7% after the guideline was implemented (see Table 11). This decrease in report attempts suggests that the ED to Inpatient Handoff Guideline reduced the ambiguity on how many report attempts should be made before bringing a patient from the ED to an inpatient unit.

Additionally, the convenience sample of time from first report attempt to patient arrival to the inpatient unit indicates a reduction in total time. This process includes the ED calling for report once a bed has been assigned, an agreement by the inpatient unit to take report, the physical act of taking verbal report, and ending once the patient arrives in the unit. Before

implementation of the tools, this process had multiple ambiguous steps (see Figure 7), resulting in variation department to department and nurse to nurse. However, with the implementation of the ED to Inpatient Handoff Guidelines and the SBAR Communication Tool, these ambiguous steps were replaced with standard work, thus reducing variability department to department and nurse to nurse. In September 2018, before implementation of the tools, the average time from first report attempt to patient arrival before implementation of tools (N=97) was 30.5 minutes (SD=18.2). The average time from first report attempt to patient arrival after implementation of the tools (N=71) in October 2018 was 24.2 minutes (SD=8.8) and in November 2018 was 21.7 minutes (SD=7.4) (see Table 10). First report attempt to patient arrival time variables for both October and November 2018 were significantly lower (p=0.000) compared to September 2018 (see Table 12). This finding suggests that the implemented tools, specifically the ED to Inpatient Handoff Guidelines and SBAR Communication Tool, provided the standard work necessary to decrease the time used for patient transfers from the ED to inpatient units. The decrease in standard deviation of 18.2 minutes to 8.8 minutes in October 2018 and 7.4 minutes in November 2018 further supports that variability in handoff processes decreased post versus pre implementation of standard work.

Looking more granular at this process, there was also a significant reduction in the length of time needed for verbal report. Handoff communications between nurses is often structured in SBAR format (Brannen et al., 2009), however, the details of what one nurse thinks belongs in "background", for example, may not align with what another believes should be reported in the same area. The unique component to the SBAR Communication Tool (see Appendix C) developed in this QI project is that it indicates must-discuss and nice-to-know discussion points. From a Lean methodology perspective, this process standardizes verbal report, reducing

variability department to department and nurse to nurse (Leggat et al., 2016). This approach is supported in the results comparing length of time for verbal report in pre versus post implementation of tools. The average length of time for verbal report before implementation of tools (N=106) was 3.8 minutes (SD=1.6), compared to 2.8 minutes (SD=1.2) post implementation in October 2018 (N=76) and 3.1 minutes (SD=1.3) in November 2018 (see Table 11). Length of time for report for both October and November 2018 were significantly lower ($p<0.05$) compared to September 2018 (see Table 13). This finding suggests that the implementation of tools, specifically the SBAR Communication Tool, facilitated verbal report between the ED and inpatient RN enough that the time needed for report decreased. Additionally, the decrease in standard deviation from 1.6 minutes to 1.2 minutes in October 2018 and 1.3 minutes in November 2018 underscores the improvement in standardization of giving and receiving report.

As the QI team worked through this project, a major theme that consistently emerged was the lack of understanding of ED versus inpatient RN workflow (see Table 5), a key concept in works of Dunbar (2004) and Hilligoss et al. (2015). While brainstorming the root causes to each gap in Current State (see Figure 7) versus Target State (see Figure 8), many of the root causes centered around the different expectations of inpatient and ED nurses. These different expectations, such as focused assessments versus head-to-toe assessments and lack of understanding of how each other organized their work, were key to the development of the ED to Inpatient Handoff Guideline and SBAR Communication Tool. However, the QI team wanted to create a process to help each area learn and appreciate the environment of the other. This lead to the creation of the Inpatient Charge Nurse Shadowing Guideline (see Appendix D) and the ED Charge Nurse Shadowing Guideline (see Appendix E). The intention of these tools was that as

new inpatient RNs and ED RNs are oriented to the charge nurse role, they will spend some time shadowing in the other's area. Since orientation to the charge role and coordination of shadowing is sporadic and somewhat infrequent, no quantitative data were obtained using these tools. However it is anticipated that their implementation can help reduce the friction that can occur from stereotypes, misunderstandings, and miscommunication (Dunbar, 2004; Hilligoss et al., 2015).

In reviewing the literature, while several articles highlighted the improvements in processes by using tools to create standard work (Brannen et al., 2009; Gopwani et al., 2015; Klee et al., 2012; Sanchez et al., 2017; Starmer et al., 2013; Zou & Zhang, 2015), the literature did not uniformly support Lean methodology for long-term improvement or staff satisfaction (Leggat et al., 2016; Moraros et al., 2016; Walker et al., 2016). While the long-term sustainability of this project is yet to be measured, the strengths/weaknesses of survey responses by the QI team highlighted some interesting perspectives (see Appendix H). From an improvement standpoint, some key comments/themes included increased ED representation on the team, especially since the ED contributes to the process, and project sustainability. However, interestingly, of the 24 QI team responses to the four questions (N=6), four team members' comments specifically mentioned how important they felt the project was. There were also seven comments that specifically referred to standardization as being a key concept in the success of the project. This theme highlights how the QI team embraced the Lean process. This finding may be specific to UNCMC, as opposed to the healthcare system as a whole, as Lean principles are used frequently throughout the UNCMC organization and is a key concept in on-boarding all staff. Additionally, there were eight comments that mentioned how this project brought to light the different workflow and cultures between the ED and inpatient units and how they hoped the

shadowing guidelines may help bridge this divide. These comments not only support this project's value and utility, but also demonstrate support for Lean methodology to help create standard work for ambiguous processes.

This project was time-intensive, requiring the QI team to meet every other week for a total of ten hours of meeting time and approximately another ten hours for project implementation. These are hours that the QI team was away from direct patient care and other projects. Thus, the support of key senior nursing leadership (e.g. Chief Nurse Officer, Associate Chief Nurse Officer, Nursing Directors, and Nurse Managers) for this work was instrumental in ensuring the QI team members were provided the necessary time and resources to develop and implement the tools. Considering the improvements in time from first report attempt to patient arrival, length of time for verbal report, and the positive survey responses, it seems this was time well spent on important improvement work.

Limitations

As with any project, there were limitations. As mentioned earlier, the main outcome metrics of ED LOS for admitted patients and admission wait time is influenced by multiple variables, not all of which are within the workflow or scope of nursing. Thus, developing local interventions to reduce LOS and wait time based on these findings are difficult to support. Considering the large scope of this project, which was implemented across the entire UNCMC Division of Nursing, there is no guarantee that the developed tools, specifically the ED to Inpatient Handoff Tool and SBAR Communication Tool, were used for every admission from the ED. This possibility also makes it difficult to measure the influence of the tools for the two main outcome metrics. Nonetheless, the length of time from first report attempt to patient arrival and the length of time for verbal report are key components in the ED to inpatient admission process as a whole. Data from this project supports that creating standard work for these key

components can decrease time involved with them, which increases the potential for decreased ED LOS and admission wait time. Addressing these key components not only help contribute to improved patient flow, allowing for more capacity in the ED, but are also important from a patient and family perspective, who probably want to spend as little time in the ED as necessary.

Although analyses from this project indicate statistically significant improvement in time for the metrics of time from first report attempt to patient arrival and length of time for verbal report, the data were taken from a convenience sample at one hospital and represented only a small fraction of total admissions. These data were also obtained manually, making the time metrics prone to bias and potentially inaccurate. Thus, it is impossible to generalize findings beyond UNCMC to the nursing community at large, or to other hospital settings. However, the number of documented reports and amount of data obtained is encouraging that results are indicative of actual improvement. As mentioned, the developed shadowing guidelines, although communicated throughout the Division of Nursing will hopefully improve ED and inpatient relations, but were not measurable within the timeframe or scope of this QI project. However, this project was important, as it is the first hospital-wide attempt to address the problem of ED to inpatient handoffs between nurses, and lays the groundwork for future work in this area.

Although survey responses gathered from the QI team (N=6) about the strengths and weaknesses of the QI project provided some good insights, there were responses from only about half of the team. This low response rate limits robust evaluation of the project. Additionally, the input provided by the QI team may not be reflective of all nurses within the Division of Nursing at UNCMC, thus reducing generalization of the comments. However, the comments were important because they highlighted how relevant this work was for both ED and inpatient nurses. The responses supported the importance and need for this work and offered suggestions for

improvement that can be used if the project is spread to other departments and healthcare facilities.

The end product and path to end product for many quality improvement initiatives are not always what one envisions at the beginning. This is an important limitation to highlight. For example, it was the hope to have a former patient be part of this QI work to provide input from their perspective. However, one was not able to be recruited. Additionally, the day to day operations of a large hospital can create unexpected confounding variables that may affect the project. An example of this was the PLC beginning to place patients being admitted from the ED to units. While it conveniently addressed one of the key identified gaps, it added another layer to the ED to inpatient process, potentially affecting ED LOS for patients being admitted and admission wait time. It can also be challenging keeping the QI team engaged and focused, as they also have patient care priorities and other projects, both at the unit and hospital level, which they are also a part of. While this did not appear to be an issue with this specific project, team engagement is an important component of all QI projects (Kenney, 2011).

This project assumed that decreased ED LOS for patients being admitted to inpatient units, admission wait time, patient transfer time from first verbal report attempt to patient arrival on the unit, and time spent on verbal report were relevant outcomes for patients. While improved processes may create more efficiency, data were not obtained on outcomes such as morbidity, mortality, errors, etc. It is therefore recommended that future QI projects looking at similar process improvements incorporate these metrics. Additionally, future QI projects should also assess the patient and family perspective of transitioning from the ED to an inpatient unit. While decreasing the time spent for the analyzed metrics are important, it is equally important to

remember that the patient and family are the end customers to this process and their perspective of the ED to inpatient experience is also a key outcome.

Implications

This QI project underscores important implications for hospital leadership, staff and patients. As indicated previously, use of Lean tools, such as A3, can offer a road-map for quality improvement work. As hospital leaders must address multiple improvement initiatives, having a step-by-step guide that can be used to lead work can be invaluable. It can create a consistent structure for the leader, and allow them to address multiple different issues in a ubiquitous way.

From a staff perspective, the Lean A3 methodology cannot be done by leadership alone. Those who perform the work day in and day out must be part of the QI team. This provides an invaluable strength to QI work, as the ones who will be asked to change their workflow should and need to have a voice in the change. For this project, four key tools were developed, but if staff do not end up using them, then the tools are worthless. Having staff be part of the solution to the problem at hand increases their investment in the developed tools and process changes.

As mentioned previously, this QI project was focused on improving time metrics. While decreasing the time patients spend in the ED, admission wait time, transition time from first report attempt to arrival in the unit and length of time needed for verbal report are important outcomes, it can be overlooked how they contribute directly to patient care and the patient experience. Ultimately, this work was done to improve the care patients receive. It is an important reminder that quality improvement work is done to benefit the end-customer, which for healthcare is almost always the patient.

Conclusions

As outlined in the literature, the nature of work in the ED can sometimes be at odds with the nature of work in inpatient units (Apker et al., 2007; Hilligoss et al., 2015). This incongruence can contribute to poor communication and unnecessarily protracted ED LOS for patients being admitted. Using the framework of the Dyadic Power Theory (Rollins & Bahr, 1976; Dunbar, 2004; Hilligoss et al., 2015), a quality improvement initiative from in June 2018 through October 2018 at UNCMC used A3 Lean methodology to reduce ambiguities in the ED to inpatient handoff process, with a goal of decreasing ED LOS for admitted patients and admission wait time. This effort resulted in the development and implementation of four tools: 1) ED to Inpatient Handoff Guideline, 2) Situation, Background, Assessment, Recommendation (SBAR) Communication Tool, 3) ED Charge Nurse Shadowing Guideline, and 4) Inpatient Charge Nurse Shadowing Guideline. Although ED LOS for admitted patients and admission wait time did not decrease, there were significant reductions in length of time from first report attempt to patient arrival to inpatient unit and length of time for verbal report.

A major strength of this project was the use of A3 Lean methodology (see Figure 3 and Table 1). This methodology provides a step-by-step roadmap for an organization to scope the problem, identify key metrics, map-out current and target states, identify gaps and root causes, develop solutions to address gaps, implement action plans, monitor the impact of action plans, and standardize the process for sustainability. Although the A3 process can be used in any organization and within any department, since every organization and department has their own unique cultures, processes and challenges, the developed solutions in other institutions may not be identical to those developed in this QI project.

Sustainability of this project will need continued monitoring. A key ingredient for success centers on the usage of the developed tools, as they provide the structure behind standard

work, so that the patient's transition from the ED to the inpatient units is done the same way for every admission regardless of clinician or unit. Future use of these tools will require frequent reminders and reinforcement, and continued monitoring and reporting of data. Additionally, to improve the sustainability of the new processes developed in this project, ED to Inpatient Handoff Guidelines will be developed and integrated into an official and vetted nursing policy at UNCMC. This action will assist with accountability on the specific handoff components outlined in the guidelines. It is also anticipated that the shadowing guidelines, although not policies, will assist in bridging any practice division that exists between the ED RN workflow and inpatient nursing unit workflow for the long-term.

When patients are admitted from the ED to inpatient areas, the process of the handoff and the specifics of patient information reported can vary from department to department and nurse to nurse. This not only creates inefficiencies, but is not an ideal process to ensure the patient receives the best care possible for each and every admission. Because of the variability in care goals and workflow, ED-to-inpatient report is commonly an opportunity for improvement (Gopwani et al., 2015; Sorrentino, 2015). This QI project provides some insight into use of A3 Lean methodology to create standard work in a process that historically has many ambiguous steps and expectations. From a nursing leadership standpoint, this process did not require expertise in Lean. Rather, a foundational understanding in A3 methods, coupled with key staff stakeholders can be impactful in division-wide process changes. Since the literature is lacking in Lean process evaluation for the nursing profession and ED to inpatient handoff specifically, more nursing QI work is needed to be published to gauge effectiveness and sustainability.

APPENDIX A: LITERATURE REVIEW MATRIX INCLUDING THEMES

Short Citation	Type	Specific Aims	Conclusions	Limitations	Themes
Apker (2007)	Qualitative	Identify handoff perceptions of ED MDs & hospitalists	Both ED MDs & hospitalists referred to handoff practice as a "gray zone" with many communication barriers	No LOS data	Communication complexity
Brannen (2009)	Qualitative	Assess the resident MD initiator versus receiver's perception of patient's severity of illness.	Six themes/identified from recorded handoff: 1. Symptoms 2. Signs 3. Laboratories 4. Trajectory of illness 5. Response to therapy 6. Potential for cure Three-quarters of the handoffs had agreement on patient severity. Low agreement for most severe problems.	Study is physician-specific. No LOS reported.	Communication complexity
Ferrara (2017)	Quantitative	Assess the quality of nurse to nurse patient handoff using the Handoff CEX scale.	Forty-eight shift changes in surgical, medical, mental health, & pediatric units performed with 192 total handoffs. Domains showed lowest median values were content, communication, & efficiency.	Did not discuss or describe or evaluate LOS in ED	Communication complexity

Short Citation	Type	Specific Aims	Conclusions	Limitations	Themes
Gopwani (2015)	Quantitative	Test if the quality of patient handoffs in the pediatric ED can improve after execution of structured handoff method (SOUND).	Compliance of each component of SOUND increased from 26.2% pre-implementation to 63.6% post implementation ($p<0.01$). The mean time spent per patient increased by approximately 20 seconds with implementation of SOUND (52.9 vs 73.0 sec, $p<0.01$).	Does not address decreasing LOS with a standard transition process.	Tools
Hilligoss (2014)	Qualitative	Analyze ways providers interpret and execute actions understood to be part of the patient handoff and admission process paradigm.	Four themes were identified: 1) persuasion 2) competition 3) packaging 4) collaboration	LOS & patient satisfaction were not measured	Communication complexity
Hilligoss & Cohen (2013)	Theoretical	Identifies two features: negotiation & coordination with ED to inpatient unit handoffs.	Negotiations highlight uncertainty with patient acuity/needs, resulting in disagreements; coordination highlights multiple steps with handoffs.	No data to discuss this theoretical framework	Communication complexity

Short Citation	Type	Specific Aims	Conclusions	Limitations	Themes
Hilligoss (2015)	Theoretical	Introduction to conceptual framework for patient handoffs under context of negotiations.	Key factors contributing to the handoff experience/process include patient acuity, relationship between communicating dyad, power distribution between communicating dyad, disciplinary perspectives, communication media & influence of any third parties	No data to discuss this theoretical framework	Communication complexity
Klee (2012)	Quantitative	CPI performed in two phases. Phase I resulted in a standardized report tool & a standard expectation to give & receive report at the bedside. Phase II evaluated practice shift	Phase I: 100% compliance via self-audits with standardized tool, 100% of reports being done at bedside, a decrease in report time from 42 minutes on average to 31 minutes, & safety checks being performed 100% of time. Phase II: 83% staff doing safety checks at the bedside & involving patients & 70% were able to complete report in 30 minutes or less.	Although the focus of this article was on nursing handoff, it was addressing solely shift-change report, rather than unit to unit / level of care change report.	Tools
Lee (2017)	Quantitative	To assess the handoff process with resident physicians, & propose algorithmic standardized process for transitional care from the ED to inpatient units.	Results of survey show that while most residency programs train residents on handoff (67%), almost half do not formally assess the residents on implementation/utilization (49%) and less than half of the programs have a structured handoff process (49%).	Physician-only study; although a structured process proposed, not assessed.	Communication complexity

Short Citation	Type	Specific Aims	Conclusions	Limitations	Themes
Leggat (2016)	Quantitative	Assessing Lean Six Sigma (LSS) process redesign perceptions on decreasing ED LOS	There was mixed agreement among participants on the success of LSS projects. Although LOS improved with LSS process redesign, going from 47% having an 8 hour LOS or less to 70% having a LOS of 8 hours or less, but concurrently had an admission rate increase by 35%. Another theme that emerged was frustration by staff of a continued push to reduce LOS, with what was felt at the expense of care time with patients.	Although participants spoke about LSS projects, there was no specific assessment of the details of the LSS LOS project in relation to collaborating with the inpatient teams.	QI strategies & Lean methodology
Sanchez (2017)	Quantitative	Evaluated effects of an asynchronous patient handoff process via a structured electronic tool for admissions from ED to inpatient.	Each year saw a continued increase in use of EMR report for ED to inpatient handoff, increase to 81.7% for AY12, 84.0% AY13, & 87.3% AY14. Duration of time patients waited to be admitted was significantly lower than patients with traditional report. These patients had a lower wait time by 9 min for AY11, 14 min for AY12, 17 min for AY13 & 18 min for AY14 ($p < 0.0001$).	Physician focused	Tools

Short Citation	Type	Specific Aims	Conclusions	Limitations	Themes
Starmer (2013)	Quantitative	Evaluated if standardized handoff tool with providers resulted in decreased medical errors & adverse events.	Medical errors decreased from 33.8 per 100 to 18.3 per 100 admissions ($p<0.01$), & preventable adverse events decreased from 3.3 per 100 admissions to 1.5 per 100 admission ($p=0.04$) following the interventions.	Provider focused	Tools
Sorrentino (2016)	Qualitative	QI project using FMEA to evaluate the handoff process from ED to inpatient.	FMEA revealed process deficits in the handoff, transportation, & hospitalists admit processes. A standardized report process was initiated to include SBAR and use of EMR for all handoffs, a "hall-pass" for hospital transport team to ensure safe transport, & creation of unit-admission guidelines so patients can be admitted to an appropriate unit.	Lacked before/after metrics; did not discuss or describe or evaluate LOS in ED based on ED to inpatient standardized process	QI strategies & Lean methodology
Walker (2016)	Systematic review	Systematic review of patient throughput literature.	14 articles were grouped according to one of three themes: 1. System entry 2. Care coordination 3. Admission & discharge processes	Most articles were case studies and no articles identified were related to ED to inpatient flow.	Communication complexity

Short Citation	Type	Specific Aims	Conclusions	Limitations	Themes
Zou & Zhang (2016)	Quantitative	This study evaluated if implementation of a standardized handoff process with providers resulted in decreased nursing errors.	The rates of nursing errors decreased from 9.2 per 100 admissions to 5.7 per 100 admissions ($p<0.001$). Handoff-related error rates decreased from 2.7 to 0.3 per 100 admissions ($p<0.001$). Delay or omission of medication/tests decreased from 0.5 to 0 per 100 admissions ($p=0.002$). Pressure ulcer rates decreased from 0.7 to 0.3 per 100 admissions ($p=0.03$). Inappropriate care of lines decreased from 1.3 to 0 per 100 admissions ($p<0.001$). Falls decreased from 0.2 to 0 per 100 admissions ($p<0.04$).	This study was on improving shift to shift report, not on admission report &, consequently, there was no discussion/ focus on ED LOS.	Tools

APPENDIX B: ED TO INPATIENT HANDOFF GUIDELINE

Scope: UNCMC ED, UNC Hillsborough ED, UNCMC Inpatient Units, UNC Hillsborough Inpatient Unit, UNCMC OBS Unit, and UNC Hillsborough OBS Unit

Purpose: Patient throughput is a complex process with multiple sub processes. Despite the complexity, efficient patient throughput is vital to patient safety while at the same time maximizing facility resources. Standard work is a vital piece of safe and efficient patient throughput. These sets of expectations are designed to provide guidance to a standard work process for patient throughput.

Tools:

- It is the expectation that both ED and inpatient nurses use a standardized SBAR report process

Timeframe:

- Receiving unit will review chart for appropriateness (i.e. isolation, PNA, acuity) before assigning patient to a bed

- It is the expectation that the ED will call for report once a bed has been assigned

Report:

- Inpatient unit to make every effort to receive report on 1st call, if primary RN can't take report, charge nurse will take report.

- If report unable to be received on 1st call, a 2nd attempt will be made by ED within 10 minutes.

- On 2nd attempt, any unit RN can take report.

- If no RN available at 2nd call, ED will communicate that the 2nd call is a rolling-call and the inpatient unit will let the admitting RN know patient is on the way to the unit.

- If report cannot be taken on 2nd attempt, the patient will be sent to the receiving unit. If the patient is going to critical care (ICU, step-down), the ED Registered Nurse will provide a bedside report. If the patient is going to an acute care floor, a copy of an SBAR report will be left on the receiving unit with a Registered Nurse. The receiving unit staff are to be directly notified of the patient's arrival by ED staff to allow for care to be transferred to the receiving unit staff. The receiving nurse can call the ED for verbal report, if needed.

- Multiple patients from any source (ED, OR, PACU, etc.) to the same inpatient units will be staggered by 15 minutes with no nurse receiving more than 3 patients per hour unless approved by the unit leadership (PSM III / CNIV) or House Supervisor.

APPENDIX C: SBAR COMMUNICATION TOOL

Situation

Chief Complaint

Where patient came from

Background

Age & gender identification

Allergies

Code Status

History

Safety needs (PNA, DSS, IVC or voluntary, family presence, etc.)

Isolation status

Assessment

Focused assessment of chief compliant

What has been done (labs, imaging, etc)

IV access (fluids, vasopressors)

Behavior / pertinent events

Diet / NPO status

Additional assessment info as appropriate (wounds, tubes, drains, trach, etc.)

Recommendations

What is known plan?

Recommendations

Disposition

APPENDIX D: INPATIENT CHARGE NURSE SHADOWING GUIDELINE

- Attempt to complete shadow experiences within 6 months (may be done within charge nurse orientation-earlier the better)

- Inpatient pediatric nurse will shadow in Main and Pediatric ED

- Inpatient adult nurse will shadow in Main ED and Psych ED

- Inpatient RN to shadow the ED CN &/or primary/psych ED nurse (depending on census/acuity)

- Targeted experience while shadowing (both adult & pediatric):
    - ED Charge:
        - Trauma
        - Triage with either Triage RN &/or ED CN
        - Code Medic
        - Code Blue

    - Primary ED/Psych ED nurse:
        - Handoff
        - Room turnover
        - Transfer to ICU or step-down
        - Bedside triage

- Amount of time for shadow experience unit-dependent on clinical needs & it is recommended to incorporate into any currently offered shadow experience for CN orientation

APPENDIX E: ED CHARGE NURSE SHADOWING GUIDELINE

- Attempt to complete shadow experiences within 6 months (may be done within charge nurse orientation-earlier the better)
- Shadow opportunity can be with either bedside RN &/or CN (depending on acuity & unit activity)
- Target areas for adult ED to shadow:
    - Psychiatry
    - Intensive Care Unit
    - Bone Marrow Transplant Unit
    - 3 Anderson (Telemetry Unit & ICCU)
    - Surgical Unit with large number of OR admissions for the day (use PLC Charge CN for ideal location)
- Attempt to spend time in various areas during shadow experience
- Target areas for Peds ED to shadow:
    - Peds unit based on acuity and OR cases for the day
    - PICU
- Targeted experience while shadowing:
    - Isolation
    - PNA case
    - Rapid response
    - Behavioral response
    - Transfers from multiple areas (ED, direct admit, PACU, ICU)
    - Huddles
    - CAPP rounds
    - Trauma rounds (unit specific)
    - Shift change or heavy Operating Room admit times
    - Significant wound care
- Amount of time for shadow experience unit-dependent on clinical needs & it is recommended to incorporate into any currently offered shadow experience for CN orientation

APPENDIX F: UNCMC NURSING RESEARCH COUNCIL PROJECT APPROVAL

From: Nursing Research (UNCMC)
Sent: Thursday, June 14, 2018 1:49 PM
To: Wolak, Eric
Cc: Shaw, Rebecca; Sanders, Jonia
Subject: 5/23/18_55 Wolak-NRC decision

Dear Eric,

Thank you for submitting your proposal to the Nursing Research Council (NRC) at UNCH. Congratulations, the NRC has approved your proposal, *Improving Emergency Department Length of Stay for Admitted Patients through the Implementation of a Standardized Report Process: A DNP Quality Improvement Project*. Chris McGrath will be the NRC contact to assist you. You may reach him at Christopher.Mcgrath@unchealth.unc.edu. If you have any questions, please do not hesitate to contact either Chris or Rebecca Shaw, the Chair of the NRC. Attached, you will find your letter of approval, a review form with suggestions from the reviewers and council members (page 16-17), and the NRC final reporting form (to be submitted to the NRC at the conclusion of your project).

Thank you for the opportunity to review and be the site for your project. We look forward to hearing back from you with results at the completion of your project. Please submit the Final Report Form to nursingresearch@unchealth.unc.edu when your work is concluded. We would also enjoy having you present at an NRC meeting to share your findings.

We wish you the best.

Kind Regards,

Rebecca Shaw

Rebecca Shaw, MA, BSW, BSN, RN-BC| CN III
Chair, Nursing Research Council
Rebecca.Shaw@unchelath.unc.edu

APPENDIX G: UNIVERSITY OF NORTH CAROLINA IRB APPROVAL

To: Eric Wolak
School of Nursing

From: Office of Human Research Ethics

Date: 6/01/2018
RE: Determination that Research or Research-Like Activity does not require IRB Approval
Study #: 18-1198

Study Title: Improving Emergency Department Length of Stay for Admitted Patients through the Implementation of a Standardized Report Process: A DNP Quality Improvement Project

This submission was reviewed by the Office of Human Research Ethics, which has determined that this submission does not constitute human subjects research as defined under federal regulations [45 CFR 46.102 (d or f) and 21 CFR 56.102(c)(e)(l)] and does not require IRB approval.

Study Description:

Purpose: Implement a standardized, evidence-based Emergency Department (ED)-to-inpatient Registered Nurse hand-off process that improves process flow and decreases patient ED lengths of stay (LOS) and wait time for admission at UNC Hospitals (UNCH).

Participants: This quality improvement (QI) project will focus on standardizing patient reporting and monitoring ED LOS for all patients admitted. This QI project will involve all ED and inpatient nursing staff for UNCH.

Procedures (methods): This is a quality improvement project and will use A3 Lean methodology to address the problem and work to find solutions for improvement.

Please be aware that approval may still be required from other relevant authorities or "gatekeepers" (e.g., school principals, facility directors, custodians of records), even though IRB approval is not required.

If your study protocol changes in such a way that this determination will no longer apply, you should contact the above IRB before making the changes.

CC:
Cheryl Jones, School of Nursing
Lisa Miller , School of Nursing Deans OfficeIRB Informational Message - please do not use email REPLY to this address

APPENDIX H: PROJECT INSIGHTS

What went well or helped?

- Being able to speak directly with RNs from the ED and see where it is that they're coming from
- Collaborating between several units that we otherwise wouldn't have done
- I think the best outcome out of the project thus far was ED nurses talking with the inpatient nurses and vice versa. Departments can be very siloed from one another so I think sitting in one room together and discussing care differences was fantastic for opening the lines of communication between ED and inpatient.
- Better understanding of other units'/ED's needs and responsibilities
- I really liked how this project was very scoped to making sure the patient moved quickly from the ED to the inpatient unit
- I'm so glad that every service line was represented and the House Supervisors and Flex Team leadership were part of the project.

What didn't go well or can be improved?

- It probably would have been good to have more ED representation.
- More unit representation, rather than just service line representation
- I really can't think of anything, this was a great project!
- I know it is still early, but we just need to make sure the tools that we developed become part of standard practice.
- I think this was a great project. I know it has helped with admitting patients from the ED on my unit. I just want to make sure the tools are used consistently months from now.
- I thought our team worked really well, but perhaps have two representatives from each service line instead of just one.

What will we do differently now?

- I'm very excited about the inpatient and ED cross-shadowing experiences. I really think that will help tremendously with culture issues.
- I'm very excited about the SBAR tool. I've already had staff tell me that it has helped greatly when receiving report from the ED.

- What is great is that now we will all do the process the same. I like how we addressed so many unknowns and inconsistencies on how we took report and brought patients up before.
- It standardized the process so now everyone knows how patients will flow from the ED.
- It feels as though the process is much more standardized now.
- I have a lot more appreciation for practices differences between the ED and inpatient units.

How will we share lessons learned with others?

- I think it is important to understand that the ED world is very different. I did not realize how different until I this project started. I know that this has been a hot topic of discussion on my unit, and now I can speak to the differences with my colleagues so that they can have a better appreciation.
- We have talked a lot about this project in my unit and has really helped understand the different cultures.
- When I precept, I plan on making sure to talk to new employees, especially new grads, about how different it is in the ED and that may be why they don't have the answers we think we need.
- I know we just went live with this project in October, so I hope to continue getting data to share with my colleagues.
- I think shadowing will really help improve the culture barrier.
- We have a unit board in our unit and that has been a great way to share this project with others.

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